ENGINEERING NEWS-RECORD

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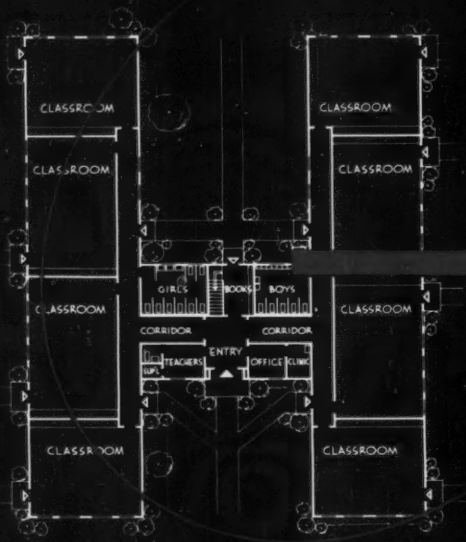

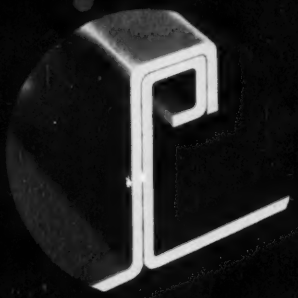

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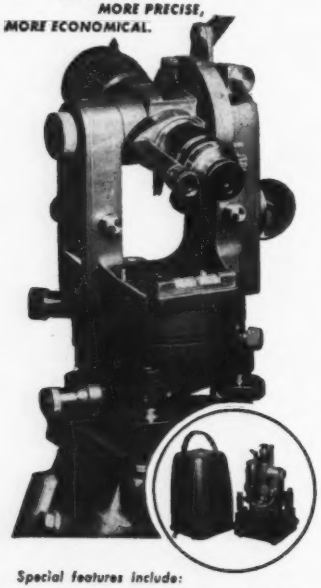

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ABP Member ABC

Volume 148 JANUARY 31, 1952 No. 5

WALDO G. BOWMAN
Editor

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ROBERT F. BOGEN
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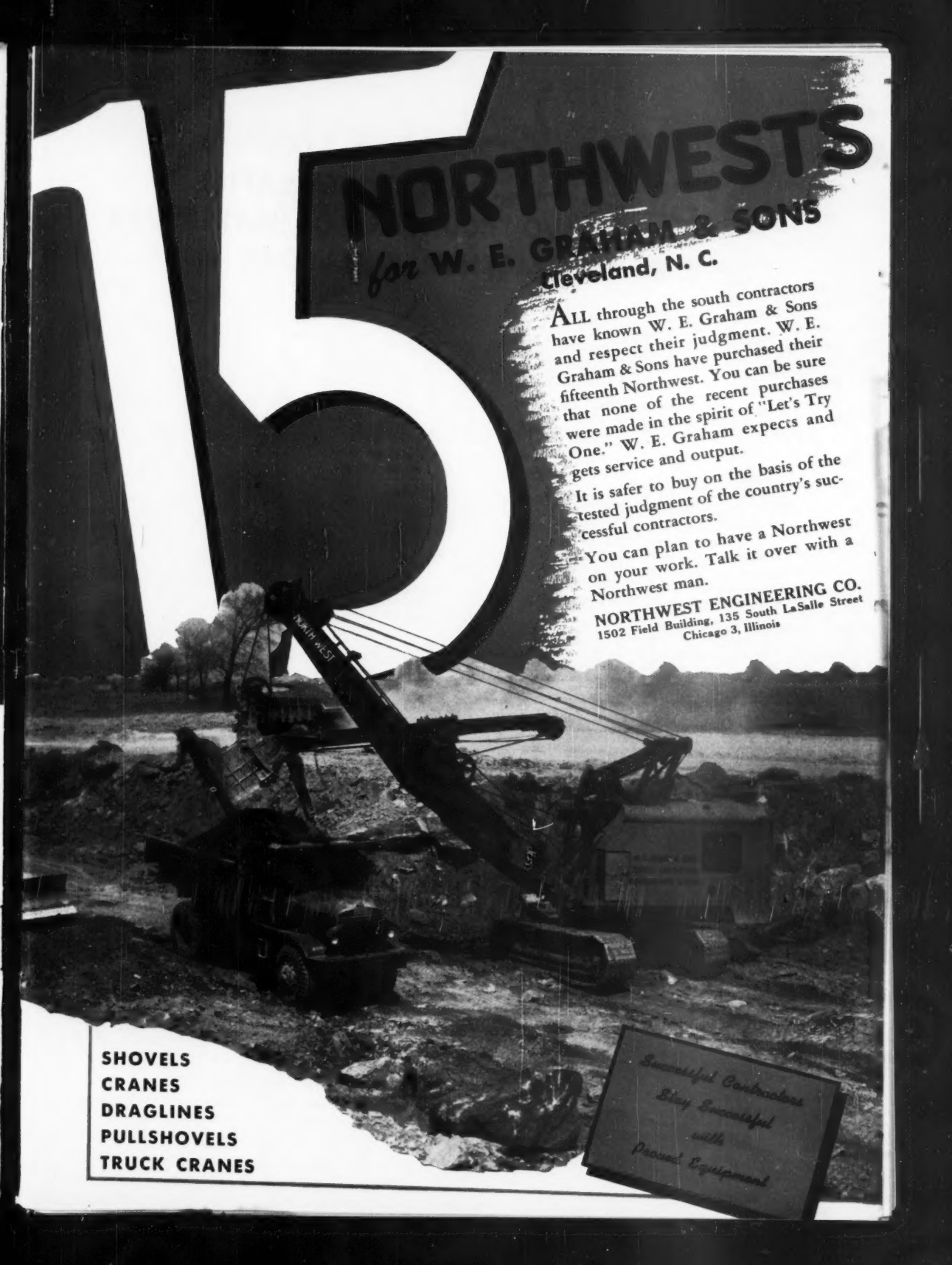
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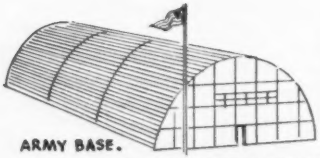
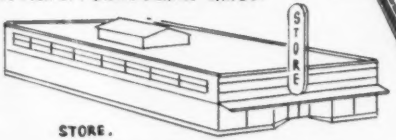


ARMY BASE.
WINTER CONSTRUCTION ON THESE BARRACKS. CAN INSTALL DRAVO HEATERS EARLY FOR HEAT DURING CONSTRUCTION AND AFTER COMPLETION.



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WITH DRAVO HEATERS, CAN USE ONE SET OF DUCTS FOR HEATING AND AIR-CONDITIONING.

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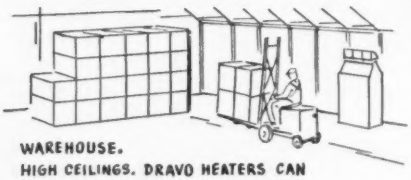
DRAVO HEATERS HAVE 150' AIR THROW. NO DUCTS NEEDED.



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HIGH CEILINGS. DRAVO HEATERS CAN REDUCE ROOF HEAT LOSS, KEEP HEAT WHERE IT'S NEEDED.

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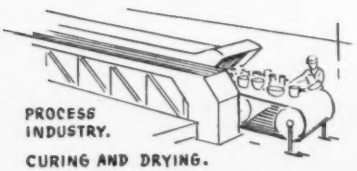
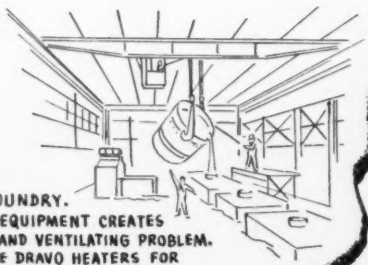
NEEDS HEAT AT WORKING LEVEL. DRAVO HEATERS IDEAL.



PROCESS INDUSTRY.
CURING AND DRYING. SPECIFY DRAVO HERE.



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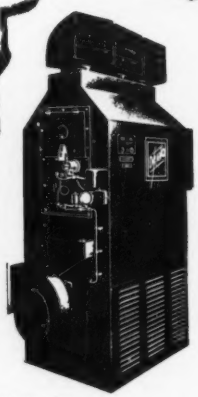

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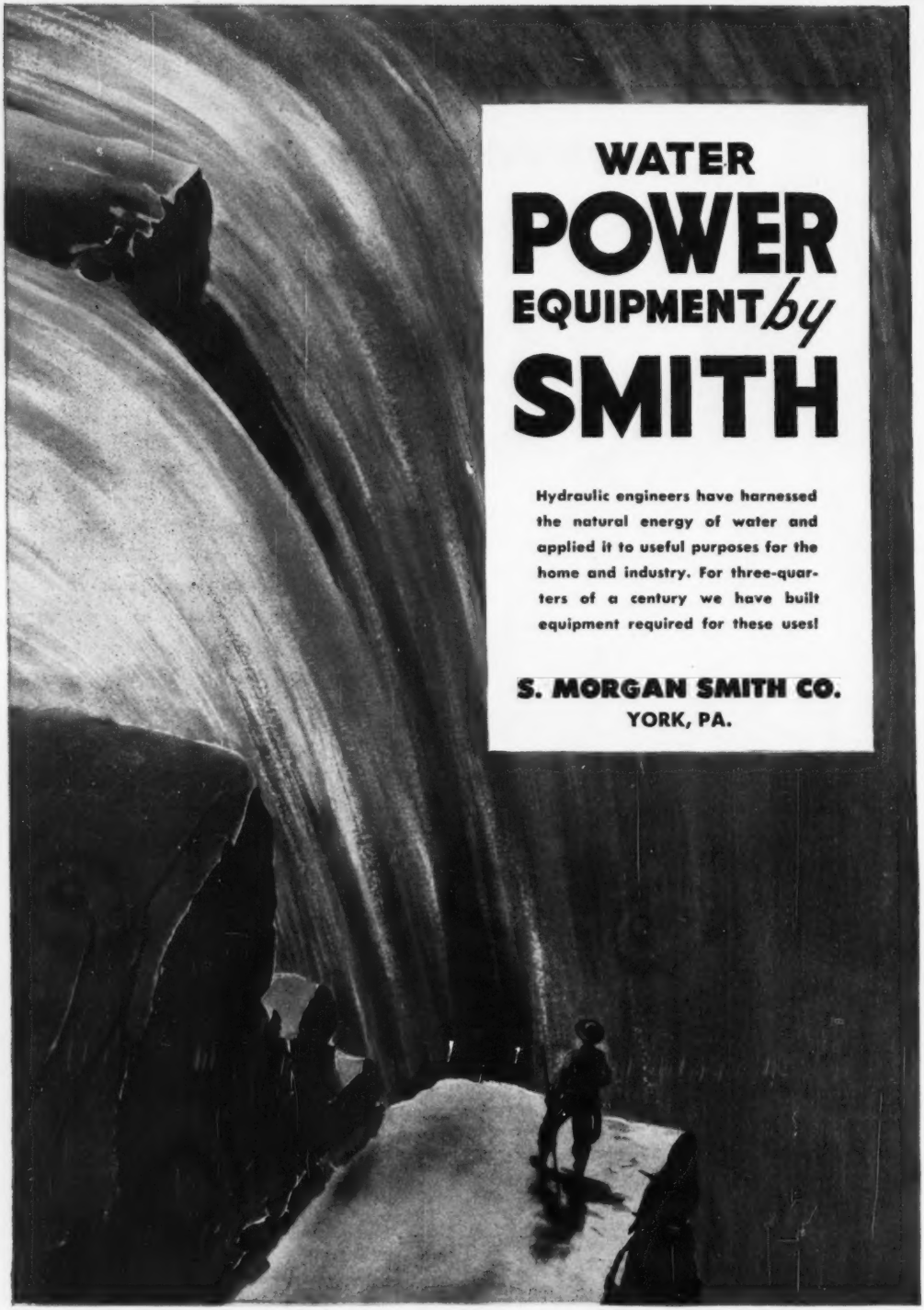
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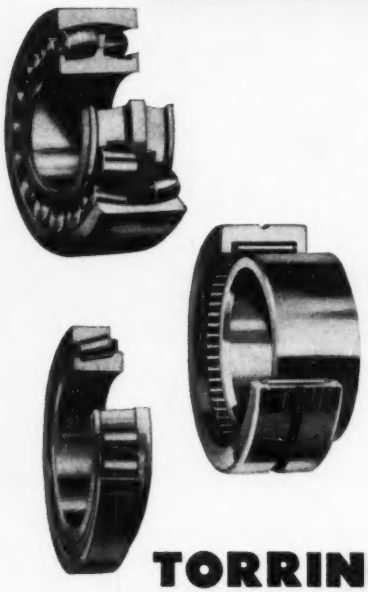

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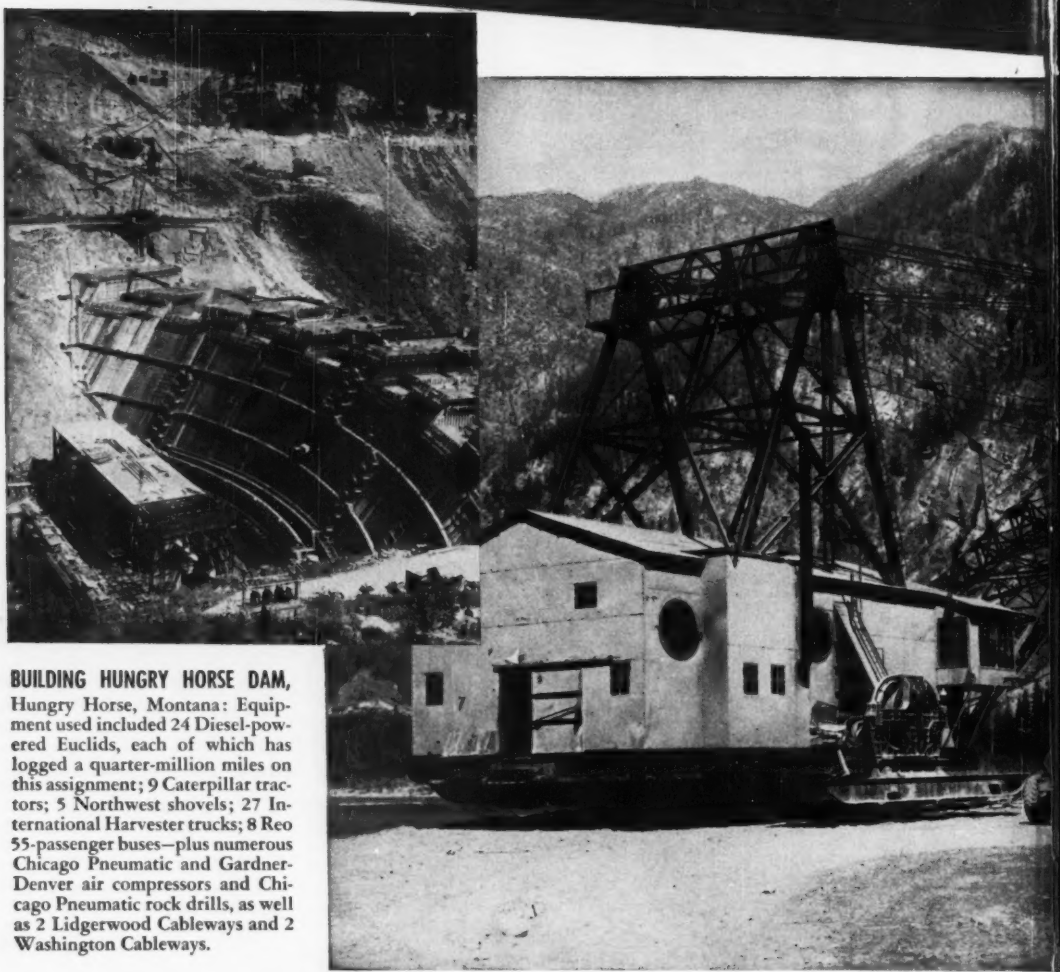

BUILDING HUNGRY HORSE DAM,
Hungry Horse, Montana: Equipment used included 24 Diesel-powered Euclids, each of which has logged a quarter-million miles on this assignment; 9 Caterpillar tractors; 5 Northwest shovels; 27 International Harvester trucks; 8 Reo 55-passenger buses—plus numerous Chicago Pneumatic and Gardner-Denver air compressors and Chicago Pneumatic rock drills, as well as 2 Lidgerwood Cableways and 2 Washington Cableways.

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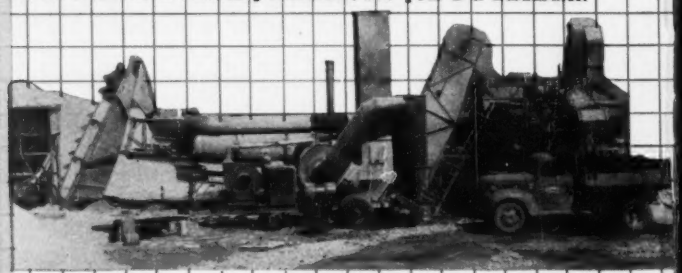

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With a capacity of up to 40 t.p.h, this plant is most practical for a broad range of users. Output is high enough for average-sized construction and resurfacing jobs — investment is low enough to assure profitable operation at minimum capacities or for intermittent operation.

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with built-in profits

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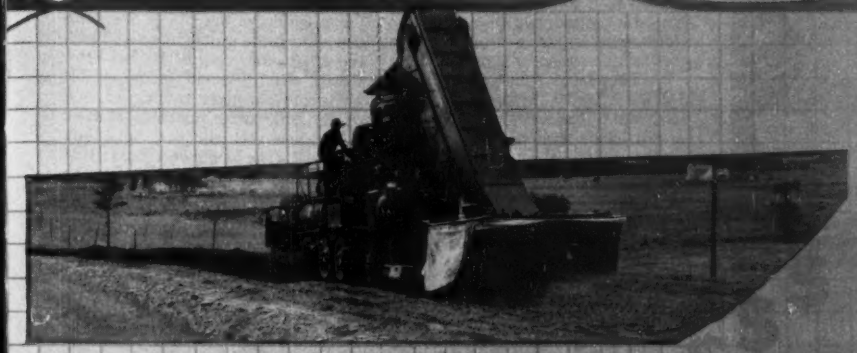
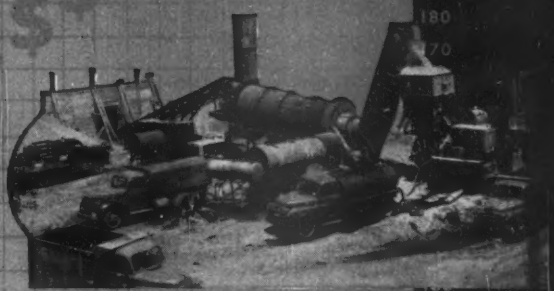
B-G MODEL 848 PLANT



B-G Model 848 Travel Plant

The B-G Travel Plant can produce over 200 t.p.h. of highest quality bituminous or stabilized mixed-in-place material. It mixes in an elevated pugmill, giving full control and eliminating bitumen losses. It has a short mixing cycle, allows the use of heavier bitumens, minimizes wet weather hazards, allows working later — and earlier — in the season.



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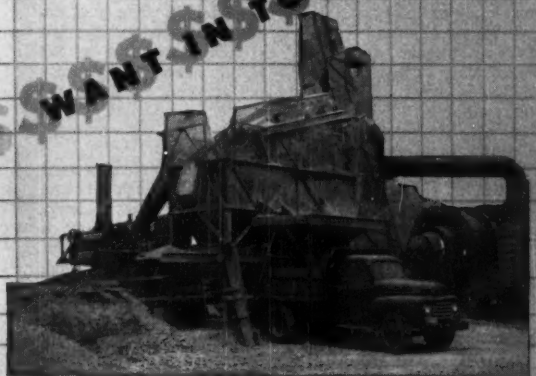

B-G Model 848 Intermediate Type Plant

Between road mix and "high type" mix bituminous construction, there is a broad range of "intermediate mix" work that is most profitably handled by this plant. With capacities up to 120 tons per hour, this plant can easily be converted to a "high type" plant by adding the B-G gradation unit. Mixer alone may be used in Travel Plant service.

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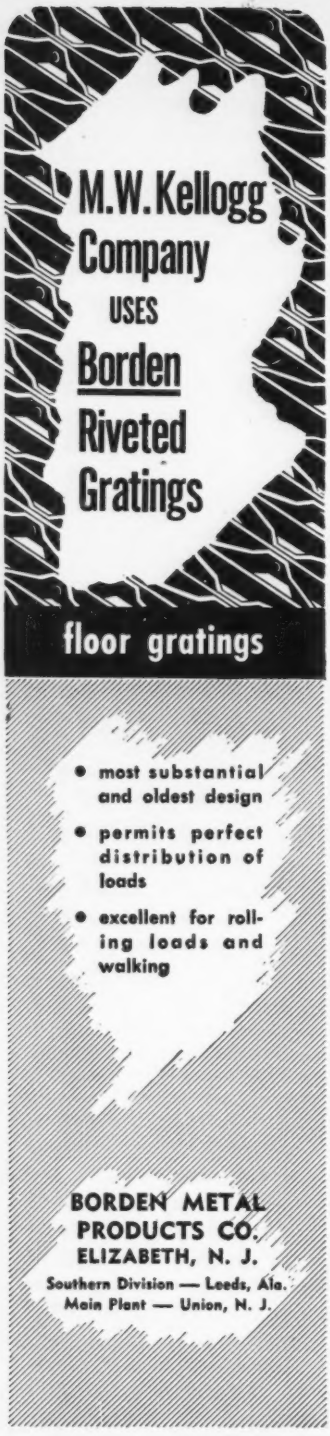


READER COMMENT

Army Engineers civil work

Sir: I have read your editorial "Congress and the Corps of Engineers" (ENR Nov. 29, 1951) and believe that I can say that many active and retired engineer officers are in full accord.

In addition to the points stressed by you, some of us believe that there should be a review of authorized projects from time to time, and authorization withdrawn from those on which there has been no activity for years for one reason or another.

We have many things to be proud of as members of the Corps of Engineers, but I believe a number of us are not happy with the way we have allowed the Corps to be used during the past nineteen years by the Administration and even members of Congress to further political ends. We will welcome a closer tie with Congress that will insure that any engineering report will stand on its merits, or if over-ridden will be for reasons clearly stated to the public.

Because I am a retired engineer officer and still subject to Articles of War, I desire to preserve my anonymity, even though I am signing this letter for your information.

USA Retired

Editor's Note—A number of comments in like vein have been received.

Contractor's responsibility

Sir: What is perhaps one of the knottier problems in the field of engineering-law is discussed in your editorial "Contractor's responsibility" (ENR Sept. 20, 1951, p. 21), and in the letter from Owen Williams, of Sir Owen Williams and Partners, London, England (ENR Nov. 29, p 47) which criticizes that editorial.

The dispute arises over your statement, "Legally, a contractor assumes no responsibility for the engineering soundness of a project he contracts to build. That is solely the engineer's." Sir Owen, on the other hand, contended in his letter, "The engineer is, in fact, the employer, stating what, in his opinion, is required to achieve a certain goal. The contractor contracts to implement the employer's final goal or objective. He may enter into a lump sum contract where he has to implement this even beyond the tender [bid] design at his own expense."

Small wonder that there appears to be a difference of opinion, for this phase of the law has been a vexing one since at least the year 1647 when the famous British case of Paradine vs Jane was decided. As a matter of fact, both the view of the editorial and that of Sir Owen can be correct, depending upon the facts of the particular case!

The situation discussed in the editorial and the Paradine case are both examples of impossibility in the legal sense.

We are told in the editorial that the engineers of the city of San Francisco had made a design for a tunnel, and that the contractor has now alleged that it would be impossible to execute the plans as designed, and at the same time guarantee that he will deliver an adequate and safe structure. The contractor holds that the tunnel may collapse and that he will be made to bear the damages of such a loss. Yet he does not wish to be held in default of his present contract, so he must proceed.

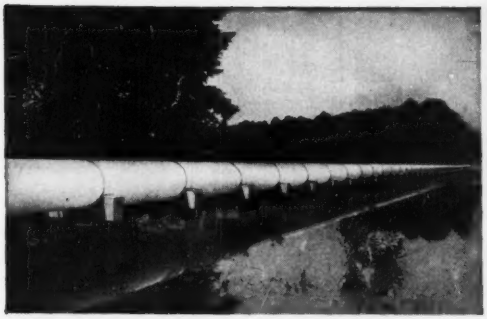
Under the strict rules of law, the contractor would in fact be bound by his agreement, and he would have to execute the contract as originally set forth, even if he has found that it is impossible to perform as contemplated. It is this rule which was set forth in Paradine vs Jane as follows: "Where the law creates a duty or charge, and the party is disabled to perform it without any default in him, and hath no remedy over, there the law will excuse him,***but when the party by his contract creates a duty or charge upon himself, he is bound to make it good, if he may,*** because he might have provided against it by his contract."

Sir Owen states, in effect, that under this rule (which is still the law today) the contractor cited in the editorial would indeed be liable for the damages resulting if the tunnel were constructed as designed, and if, when so constructed, it eventually collapsed.

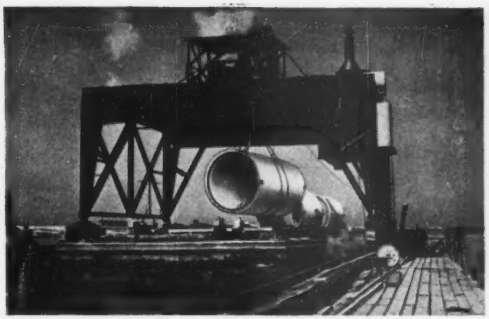
Sir Owen would be correct were it not for the fact that through the years there have developed a series of exceptions to the rule that impossibility is no excuse. A study of the exceptions which have thus far been permitted, would show that, for the facts outlined in ENR of Sept. 13, 1951, p. 29, the editorial was indeed correct in its statement.

A complete list of the exceptions and the various reasons therefore would take more space than these columns permit, but the American Society of Civil Engineers has published in its Proceedings, a paper

(Continued on page 14)



Lee Hall Reservoir crossing, part of the 237,400′ of 24″, 27″, 34″ and 39″ Lock Joint Reinforced Concrete Cylinder Pipe supplying water to the Newport News shipyards.



Loading a section of 120″ Lock Joint Reinforced Concrete Subaqueous Pipe for 18,500′ Nottingham Intake, supplying water for the City of Cleveland.

Build for the future... with
LOCK JOINT CONCRETE PRESSURE PIPE

Tulsa's new water supply line includes approximately 280,000′ of 84″, 72″ and 66″ Lock Joint Reinforced Concrete Pressure Pipe.

Lock Joint plant where 233,000′ of 69″ and 66″ Prestressed Concrete Cylinder Pipe were manufactured for the Rio de Janeiro water supply line.

The building of a water supply line represents a large and extremely important investment. For this reason every effort is made to select the most dependable and permanent type of pressure pipe for the project. Investigation to determine the most reliable pipe available will show that Lock Joint Concrete Pressure Pipe has proven its superiority by years and years of unparallelled performance.

The permanence of Lock Joint Pipe eliminates any necessity for replacement of the line. The conservative design of its steel reinforcement avoids the dangers of blow-out or rupture while providing an ample safety factor for unusual internal pressures and heavy backloads. Dense concrete walls prohibit tuberculation or corrosion and assure extreme durability and life-long high carrying capacity.

In short, Lock Joint Concrete Pressure Pipe provides permanence, efficiency and safety for one of the most vital and essential public utilities. For your next water supply project involving pipe 16″ in diameter or larger, specify Lock Joint—the pressure pipe whose future has been proven by its past.

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(Continued from page 12)

entitled, "Impossibility of Performance In Contracts For Engineering and Construction," written by the undersigned (Vol. 76, Separate No. 36, Nov. 1950, and Vol. 77, Separate No. D-36, Oct. 1951) which treats the entire subject of impossibility and the exceptions at some length.

One quotation from that paper will indicate the trend of thinking in the courts of this country.

"In the MacKnight case, specifications were prepared by the city of New York containing a detailed plan of the construction of an underground room. The contractor agreed to make it watertight. When it was built according to the specifications and was not watertight, it was held that the contractor had completed the contract and could recover the contract price. The court stated: If I agree to produce a certain result according to my own plan, I impliedly warrant its sufficiency, but if I agree to produce that result by strictly following the plan prepared by another party, he impliedly warrants the sufficiency."

A few cases have held a view contrary to that quoted above, but it is the belief of the writer that ENR was correct in its editorial comment on the legal aspects of the controversy arising over the tunnels at San Francisco.

ROBERT F. BORG,
Project Manager,
Terry Contracting Inc.,
New York, N. Y.
Member, New York State Bar.

Slide rule has a brain

Sir: I note in the issue of January 10th, p 60, the article, "Easy way to find moments." It strikes me as being a case of making a large mountain of a very small molehill.

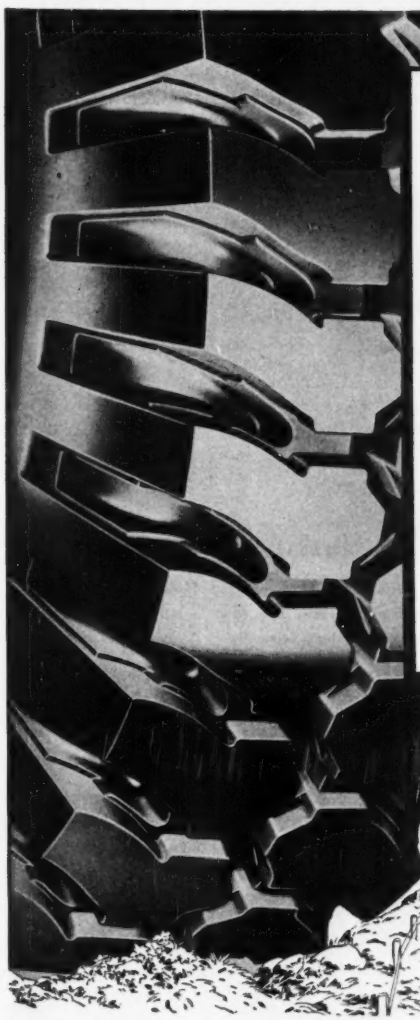
The operations of finding reactions and moments in a simply supported beam are so simple and obvious that the ordinary engineer does it in nothing flat. All it takes is a good grip on a well trained slide rule. No a factors; no b factors; just a knowledge of fundamental principles.

Out here our slide rules become educated. All we do is hold them. They solve our problems while we blissfully dream of that beautiful blonde we saw last night.

GEORGE W. MILLER
Structural Engineer
Glendale, Calif.

EDITOR'S NOTE: Pleasant dreams. But some readers may not own so well educated a slide rule and may, therefore, welcome an easier method of calculation.

U.S. ROYAL
FLEETMASTER Truck Tire



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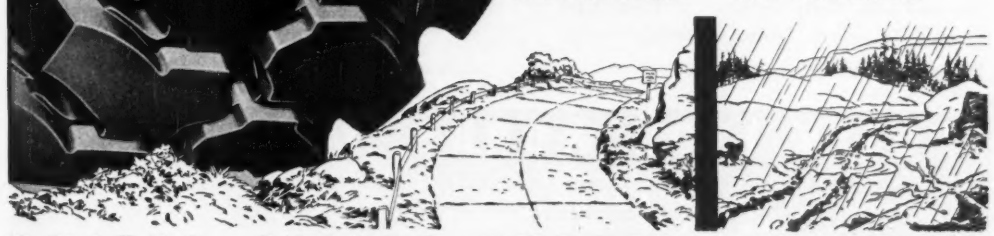
SEE ONE TIRE DO TWO JOBS

ON THE ROAD **OFF THE ROAD**



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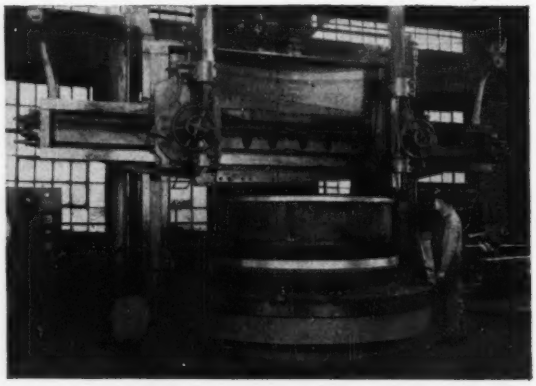
Posey Iron is equipped to do the complete job . . . from helping you determine correct type and size straight through to stress relieving, x-raying, pickling, painting and erection. The facilities of two large plate shops, an up-to-the-minute machine shop and a large foundry eliminate needless delays. Posey fabricates to meet both standard and special requirements in tanks up to all capacities. Write today for free 12-page reference bulletin.



This 16'6" vertical boring mill is one of the many tools recently added to Posey Iron's machine shop. This shop is fully equipped for the diversified machining operations demanded by Posey's different divisions.

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EDITORIALS

Chicago's ten-year plan

CHICAGO'S BOLD and far-sighted plan for $1,683,000,000 worth of public improvements during the next 10 years —outl'ned in last week's issue, p. 50—is no flight into fancy. Based on hard-headed facts and figures, it should raise no great public apprehension, since the projects are soundly conceived and essential to the health, livelihood and convenience of a great number of people.

Nor are the proposed projects especially startling, either in physical magnitude or construction costs. Most of them have been urgently needed for years. An outstanding example is the need for an up-to-date south side railway terminal to replace widely dispersed and antiquated stations.

Perhaps the most significant recommendation in the program is that 75% of the proposed work be financed by revenue bonds, retired by income produced by the projects themselves. Early recognition that such a costly program cannot be financed by the tax-secured bond method enhances the feasibility of the projects over others of a similar nature that Chicago has studied and then abandoned in the past.

The proposal by the Chicago Plan Commission that a public service authority be established to borrow money to construct those projects that are deemed self-liquidating, and to operate them, may meet with strong opposition from some quarters. But such a plan has many merits, as demonstrated in other metropolitan centers.

Just as post-war planning was of utmost importance before the shooting had stopped in World War II, so is vigorous, long-range planning needed today. Chicago has shown the way. If the city can now go ahead in drawing up a financial plan and in developing actual project designs, it will be in a fine position to start actual work immediately the present defense restrictions are relaxed.

The President's budget

MANY SUBJECTS of special interest to civil engineers and construction men were discussed in the President's budget message to Congress. Only one was a real surprise, and a welcome one at that. It was President Truman's announcement that the recommendations of his Water Resources Policy Commission had been under active study during the past year and that legislation looking toward better development of those resources is being prepared in his office. Some people had begun to fear that the commission's legislative proposals had been purposely suppressed because they were not in harmony with the thinking of the President and his close advisors on such matters as river valley authorities.

As was to be expected, few new multiple-purpose river projects appear in the budget. The principal new flood-control projects are in the Kansas-Missouri area where disastrous floods occurred last year. Most of the remaining work is simply a continuation of large projects started before the Korean emergency. Nevertheless the total amounts in the budget for this work are large.

Hopefully, the President put in $15 million for a start on the St. Lawrence power and navigation project and again urged Congress to authorize that work. He calls attention to the Canadian government's announced plan for independent construction of both the power and navigation facilities and says that he is prepared to "support such action by Canada if that is the only way to obtain immediate construction of the project." As the dams required for the project must extend across the border into New York State, the only effective support he could give would be to get the Federal Power Commission and the International Joint Commission to approve participation in the work by the Power Authority of the State of New York. Congressional approval could be bypassed in that way, but heretofore President Truman has not favored development of the St. Lawrence power by New York State. He wants that power to be developed by some federal agency.

The President also asks Congress to provide funds "to continue planning the urgently needed redevelopment of Niagara power facilities made possible by the treaty with Canada." There is no logic in that request when Congress will be hard pressed to find money for all the budget requirements and in view of the announced willingness of the Niagara Mohawk Power Corp. to undertake the work with its own funds.

Most disappointing is what the President says about highway construction. He notes that expenditures of federal-aid funds during the current fiscal year are expected to be about $100 million below the authorized $500 million, also that shortages of steel will probably keep expenditures at that level in the fiscal year starting next July. Hence he recommends that the already authorized $500 million for that year be cut back to $400 million.

In view of the serious condition of this nation's highways, a much better plan would be to let the $500 million authorization stand in the hope that by that time more steel will be provided by the current expansion of the nation's steel production capacity. Present indications are that the state highway departments are planning to expand their new construction this year, chiefly through widespread substitution of concrete for steel in structures. That plan should be encouraged, not discouraged, by a cut in federal aid.

This fact stands out of the budget message. Federally financed construction—both civil and military—is going to be much larger this year than it was in 1951, if Congress goes along with the President.

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LONE STAR MASONRY MORTAR WINS CRAFTSMEN'S PRAISE ON ATTRACTIVE NEW LINCOLN HOTEL, ODESSA, TEXAS

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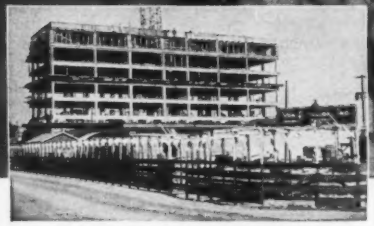

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HOUSING BONDS AND THE MARKET FOR MUNICIPALS

This year will see a real contest in the money market, between conventional state and municipal bonds and offerings by local public housing authorities. The housing bonds are issued with Federal support, to finance low-rent housing in U. S. cities.

Sales of these housing bonds were big enough last year—more than $330 million. But they will more than double in 1952, to about $700 million.

Totals for future years will be even greater. Present building under this program is restricted by Congress to 50,000 starts a year. But this limit is only temporary; up to 135,000 starts a year will be allowed once mobilization passes its peak. When starts begin to approach that figure, sales of housing bonds will grow, too. Final total of these bond issues may reach as much as $6 billion.

So these local housing bonds will be a major feature of the state and municipal bond market for some years to come. They are expected to make up about 20 per cent of all new issues in 1952, and their share may be even larger in some future years.

• **Tough Competition**—These housing bonds have a big advantage over other state and municipal securities. They are tax exempt, just like other municipals. And on top of that, the Federal government guarantees both principal and interest. The combination of safety and tax exemption puts housing bonds among the most attractive investments available in these unsettled times.

A big sale of housing bonds on January 15 showed how the Federal guarantee pays off. The new bonds worth $134 million were sold at substantial premiums. Average interest cost to the borrowers was actually lower than it was at sales last year—1.959 per cent against 2.0519 per cent. And this happened at a time when interest costs on other tax free bonds were marketedly higher than they were during most of last year.

In other words—investors are more interested in guaranteed housing bonds than in the average run of state and municipal securities. They show their preference by accepting a drop in the rate of interest on housing bonds at the same time that they insist on a higher rate of return from other investments.

This new competition for money is not a major problem this year—since there is enough money available to finance as much building as the materials situation allows. (See last two TRENDS)

But it could be a big problem in the future. If money becomes tight by, say, 1954—and it could happen—big issues of housing bonds might grab the lion's share of new money, make it difficult to float new issues to finance other types of construction.

• **Brighter Notes**—Despite the big flotations of housing bonds, the future market for municipals should be pretty good. Two events within the last two years brighten the long-range outlook.

The decline in veterans' bonus financing is one bright note. Issues of bonds for veterans' aid averaged $560 million a year between 1947 and 1950. But veterans' bonds dropped abruptly in 1951—From $645 million in 1950 to only $82 million.

This big drop in veterans' issues means that—other things being equal—the markets can absorb more bonds to finance construction.

High tax rates also brighten the long-range outlook for tax free bonds. Mobilization has made high taxes an almost permanent part of the American scene. Tax rates may drop some if a different party takes over in Washington. They will undoubtedly go down when the defense program slows down in 1953 or 1954. But it is unlikely that taxes will ever return to the low levels of pre-World War II days. And state and municipal bonds—being tax free—can count on pretty good sales as long as taxes stay anywhere near their present levels.

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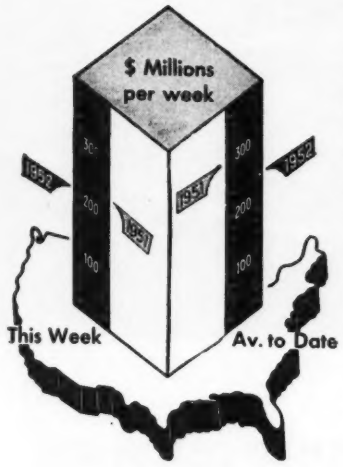
THE CONSTRUCTION WEEK

ROUGH RECEPTION—The President's executive order setting up a Missouri Basin Survey Commission (ENR Jan. 10, p. 21) got hostile treatment from the Missouri River States Committee last week. Committee member Gov. Val Peterson of Nebraska charged Truman with "repudiating his own federal agencies and slapping in the face every governor who has participated in the workings of the Missouri Basin Inter-Agency Committee." Other members criticized the move as a possible opening wedge for creation of a Missouri Valley Authority (MVA), then made those views the official committee expression.

ARKANSAS FRIENDSHIP—A Highway Audit Commission, authorized by the last session of the Arkansas legislature, is investigating State Highway Department activities during the four-year period July 1, 1947 through June 30, 1951. At hearings last week charges of "favoritism" and "kickbacks" in purchase of construction equipment were aired. Queried on the purchase of six pieces of road equipment at $750 per unit higher than the low bid submitted by the dealer for another brand, Highway Director J. C. Baker was asked "Isn't that rather expensive friendship?" Replied Baker with a grin, "It all depends on how you value your friendships." This week construction contract letting is in the spotlight.



NO COMMENT—AFL's Building Trades Department bigwigs began ten days of heavy thinking on many problems at Miami, Fla., last week, but said nothing for publication on their discussions. Private advices indicated, however, that first order of business is the fate of the National Joint Board for Settlement of Jurisdictional Disputes—threatened by a fight between electricians and operating engineers (ENR Jan. 24, p. 77).

WUNDERLICH CASE—Bills have been introduced in both houses by chairman of the judiciary committees—Sen. Pat McCarran and Rep. Emanuel Celler—to permit court review of decisions by government contracting officers. The Supreme Court recently ruled that such decisions are final under present law, unless fraud can be proved. (ENR, Dec. 6, p. 25). Hearings will begin in February.

Contracts by type of work

	This Week	Cumulative 5 wks 1952	Cumulative 5 wks 1951	% chge
Waterworks	$2.0	$26.5	$15.5	+71
Sewerage	3.8	16.9	36.9	−54
Bridges	4.5	18.4	33.2	−45
Highways	13.2	107.3	85.3	+26
Earthwork, Waterways	24.5	46.9	20.4	+130
Buildings:				
Public	33.4	137.5	350.2	−61
Housg., pub.	14.4	73.9	89.8	−18
Housg., priv.	49.4	262.4	189.1	+39
Commercial	4.4	32.2	87.3	−63
Industrial	49.3	337.4	507.0	−33
Unclassified	13.6	137.4	87.3	+57
Total	**$212.5**	**$1,196.8**	**$1,502.0**	**−20**

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

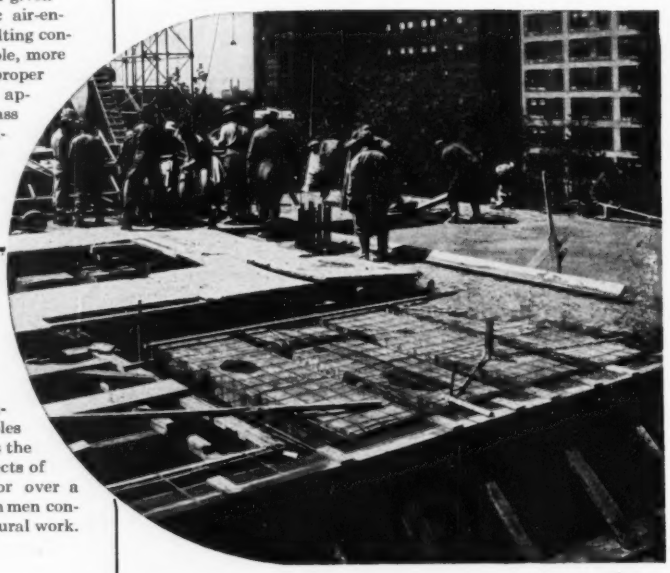
ENR COST INDEX

Index Base = 100		1913	1926	1949
Constr. Cost	Jan. '52	547.83	263.34	114.84
Bldg. Cost	Jan. '52	405.62	219.26	115.20
Volume	Dec. '51	404	164	117

IN THIS ISSUE—The Wage Stabilization Board takes crackdown action to enforce construction wage ceilings (p. 23) . . . Where tragic air crashes occurred, engineers are tackling solution at Newark Airport (p. 24) . . . New construction regulations are being readied by National Production Authority (p. 25) . . . Restrictions on home building are expected to hold starts to 800,000 this year (p. 26) . . . Controversy continues over force-account highway work (p. 28) . . . Concrete walls with built-in insulation are rolling off production lines (p. 30) . . . Arch bridge construction beats rainy season (p. 32) . . . A set of gantries helps save money on building a prison wall (p. 36) . . . Building a huge brewery in Newark, N. J. proved to be a complicated job (p. 39) . . . Better plumbing design can effect savings (p. 40) . . . Huge slum clearance plans are underway in Newark, N. J. (p. 45) . . . Canada outlines details of seaway construction (p. 46) . . . NLRB refused to intervene in jurisdictional dispute (p. 58) . . . Contractors are shuffled on deluxe Army project (p. 60).

Better for structural work

Less mixing water is required for a given slump when you use Duraplastic air-entraining portland cement. The resulting concrete is more plastic, more workable, more cohesive and uniform. This aids proper placement and improves surface appearance of both structural and mass concrete jobs. This is especially important when columns are heavily reinforced as shown in photograph.



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WSB fines contractor $80,000

Hedin Construction Co. overpaid bricklayers; penalty "only the beginning," prosecutor warns

The Michigan Regional Enforcement Commission of the Wage Stabilization Board this week levied penalties totalling $80,000 against the J. D. Hedin Construction Co., Inc., of Washington, D. C., which violated WSB regulations by paying over-ceiling wage rates to bricklayers (ENR Dec. 20, p. 23).

The decision settled the nation's first major contested violation charge that went to formal hearing. An enforcement attorney, Russell Helterline, indicated that the decision in the Hedin case is "only the beginning" of the enforcement program.

The case was tried at Detroit in December, and involved wage rates paid by Hedin during the building of the $7,152,000 Veterans' Administration Memorial Hospital at Ann Arbor, Mich. The established area rate for bricklayers was $2.75 an hour. However, witnesses testified that Hedin was unable to secure an adequate supply of bricklayers at that rate.

Hedin and various union officials began an extensive but unsuccessful recruiting campaign in several states. Because the project was falling far behind schedule and the Veterans Administration was pressing him to complete the project, Hedin put a $3.00 rate in effect in February, 1951. Even so, sufficient bricklayers were not obtained until May, when the company began a 9-hour work day, 5 days a week, paying double time for the 9th hour. The project continued to lag, however. As of Nov. 30, 1951 construction had run 73 days late. Hedin's contract with the VA called for a penalty of $250 per day for delay beyond the specified completion date.

The tripartite enforcement commission found that between Feb. 28 and Nov. 14, 1951, Hedin's gross payroll for journeyman bricklayers totalled $116,131.50. Of that amount, $9,676.76 represented the 25 cents per hour in excess of the lawful rate.

• **Penalties cited**—Under terms of the Defense Production Act, the commission could have ordered income tax disallowances for the entire $116,131.50. Beyond that, it could have asked the VA to deduct the same amount from payments due the Washington firm for building the memorial hospital.

The commission, however, ordered that Hedin not be permitted to deduct as an expense item in computing its 1951 income tax $40,000 of the wages paid to the bricklayers (Hedin—if it comes within the 80% tax bracket—actually will pay about $32,000 under this penalty). Further, the commission instructed the VA to deduct $40,000 from amounts due Hedin.

Leniency was granted because the commission found that the company "was not guilty of any acts of dishonesty or concealment." The commission was also of the opinion that the company had taken its action in good faith.

The case grew out of a complaint issued by Hyman Parker, regional counsel. Hearings were carried out over a three-day period in December. Government witnesses testified that the illegal rate paid by Hedin had an unstabilizing effect in the Washtenaw County area, and led to pirating of labor.

• **Wage laws challenged**—Early in the hearings, Hedin challenged the constitutionality of the Defense Production Act and the regulations issued thereunder by WSB. It was also asserted that enforcement provisions are penal in nature, and therefore the respondent should be guaranteed the right of trial by jury. The commission disagreed, on grounds that this was a civil, and not a criminal, action.

A motion to dismiss the hearing on the grounds that insufficient time to prepare for the hearing had been granted the respondent was also overruled.

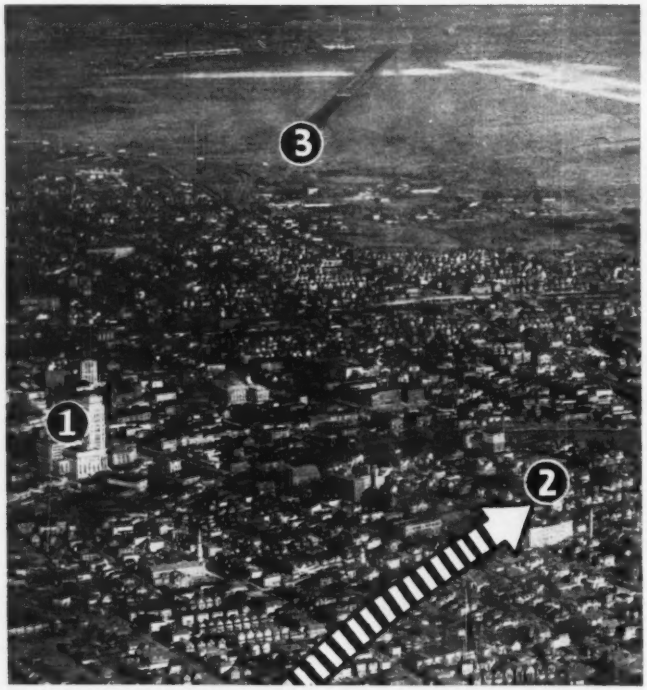
Later, J. D. Hedin, president of the construction firm, testified that he had called the Wage Stabilization Board last January and February, to ask whether he could lawfully pay the $3 rate. Hedin said that he had been informed that he could legally put a 10% increase into effect.

The commission termed this as merely conversation, which in no way was intended to be construed as a formal approval or authorization for the higher rate.

The commission added that the Hedin company had been put on notice by WSB in April that it might be in violation of wage regulations, but that the company continued to pay the $3 rate.

The Michigan Regional Enforcement Commission's ruling may be appealed to the National Enforcement Commission within 14 days. Any judgment which may be handed down by the latter agency is said by WSB to be final.

HAND DOWN DECISION—Members of the Michigan Regional Enforcement Commission for the Wage Stabilization Board who heard the Hedin Construction Co. case in Detroit are: (left to right) Jean T. Sheafor; Leonard A. Keller, chairman; and The Rev. G. Paul Musselman. (Jim Shepperd photo.)



NEWARK AIRPORT as it is viewed from a plane over downtown Elizabeth, N. J. The regular glide path for landing takes air liners directly over the Union County Courthouse (1). Last week a plane veered and crashed beyond the school building (2) killing 29 persons. It was headed for the runway (3). (Air photo by Speed Hanzlik.)

Engineers grapple with crash menace at Newark's $47-million air terminal

By James M. Connolly
Associate Editor

The immediate public cry for "plowing under" or moving New York's mammoth Newark airport after two plane crashes within a month had killed 87 persons—some of them residents of nearby Elizabeth, N. J.—this week came up against two solid (and publicly uncounted) facts:

(1) The enormous expenditures—about $50 million—on airport construction and current expansion.

(2) The growing importance of the airfield itself to the vital commerce and communications of the teeming New Jersey-New York metropolitan area, the world's richest air transport market.

While citizens committees met to protest the danger to innocent townpeople in areas mushrooming around the airport; while New Jersey's governor sought legal advice as to whether he could stop operation of the airport by the bi-state Port of New York Authority; while Civil Aeronautics Administration investigators checked into the latest crash;—the fact of the airport's importance remained unchallenged, and it was apparent that no sudden action would result in closing it.

• **Hard facts**—So important is the airport to the metropolitan area, in fact, that special highway connections were made between it and the newly opened New Jersey Turnpike. Newark airport is today within a 20-minute uninterrupted ride of midtown Manhattan—by far the closest in point of time of any of the four major air terminals serving the area.

As to construction work, the Port Authority estimates that something over $23 million had been spent on the field before current expansion plans were begun. By the end of 1951 about $24 million more had been spent or committed on a current program of entirely new runways to replace the existing ones, a new administration building, diversion of ground drainage systems, and numerous other facilities to make the operations safer and speedier.

Well aware of the growing restrictions of the area, as surrounding marshland was reclaimed for housing and industrial use, the Port Authority has made elaborate plans to rebuild the airport so that air traffic is directed away from congested and obstructed areas.

The first taxiway will be in operation early in February and the first of four new 200 x 7000-ft runways is scheduled for November 1952 completion. This runway will divert over 90% of the takeoffs and landings that currently run over the highly congested areas.

• **Importance**—The scope and complexity of an airport program for financing, construction, promotion and operation of a regional system of airports (PNYA now operates LaGuardia, Idlewild and Teterboro airports in addition to Newark) is becoming more apparent daily.

Construction-wise, PNYA's efforts to carry out its vast program in Newark involve a $6-million Terminal Building, the foundations for which have just been completed. The two new runways now under way to replace existing facilities will establish a completely new set of landing and takeoff patterns. They will have a peak hour capacity of 120 aircraft movements. With their completion, two more are contemplated when traffic at the airport requires them (see map).

• **Obstructed areas**—Most bothersome problem in connection with the installation of the new runways was that the Port Authority was not only limited to approach patterns laid *down* by CAA. But they also had to set up the alignment to thread traffic through what they know only too well to be an obstructive area, at the same time avoiding the congested areas.

This is and has been a tremendously difficult problem and an exact three-dimensional scale model of the entire area shows no less than 60 such obstructions, light poles, water towers, chimneys, catenary towers of the Pennsylvania RR, etc. Many of these obstructions had to be lighted—at Port Authority expense.

Authority engineers have been spending months on and co-operating with design engineers of the New Jersey Turnpike Authority on the proper location of their toll booths, bridges, structures and ramps in the vicinity of the airport. Scores of

schemes were tried and discarded—suggestions from within PNYA and from outside sources—until finally the best possible integrated plan was decided upon. It is a "90-degree runway pattern" which automatically limits the number of approach patterns, reduces the number of flights over the congested and obstructed areas, and provides approach zones paralleling those for the Authority's other airports, thus preventing conflicting cross traffic.

• **Growing steadily**—Newark is the only major air terminal in the state of New Jersey and a cessation of its operations would divorce people there from all connection with large-scale commercial aviation.

Air traffic during 1951 reached an all-time high at Newark for passengers, cargo and mail. Scheduled passengers numbered in excess of 1,222,000 while plane movements reached 100,177. In addition, nonscheduled and contract carriers accounted for 139,340 additional passengers. During 1950 and 1951 over 55% of scheduled domestic air cargo in the metropolitan area was handled at Newark with nonskeds and contract carriers handling over 2 million lb alone. Domestic air mail movements exceeded 6 million lb both years.

Current development of the airport by the Port Authority including the recent acquisition of 800 acres of land, is apparent. Future expansion (in addition to runways #3 and #4) will include cargo maintenance and repair facilities and, a shopping and recreational center. The entire program will be geared to make available a complete range of domestic services there.

NPA submits draft of new regulations for counsel from construction advisors

Residential construction is to get separate treatment under a proposed revision of CMP Regulation 6 that the National Production Authority submitted last weekend to its Construction Industry Advisory Committee. Except for that important change, the new draft proposes only minor modifications in the present CMP rules governing construction.

A sharp cut in allocations of controlled materials for housing led the mobilization officials to switch to new machinery on residential controls. The Housing and Home Finance Agency now hopes to have a CMP housing order ready to submit this week to the CIAC, in time for the committee to consider it along with the new construction regulation at a meeting on Feb. 11. (see story on next page).

RUFE B. NEWMAN, director of NPA's Construction Controls Division.

Omitting the housing rules (to be issued separately), the new regulation submitted last weekend consolidates three documents in one package and rephrases them in simpler language. The three documents are the existing CMP Regulation 6, Direction 1 to that regulation, and NPA order M-4A.

One new section has been added to the proposed regulation in an effort to draft a rule for permitting use of foreign or salvage (used) steel. NPA particularly asks suggestions on this section. As drafted, the section would allow a claimant agency to approve an application for use of such steel on an essential project that does not require substantial quantities of other controlled materials.

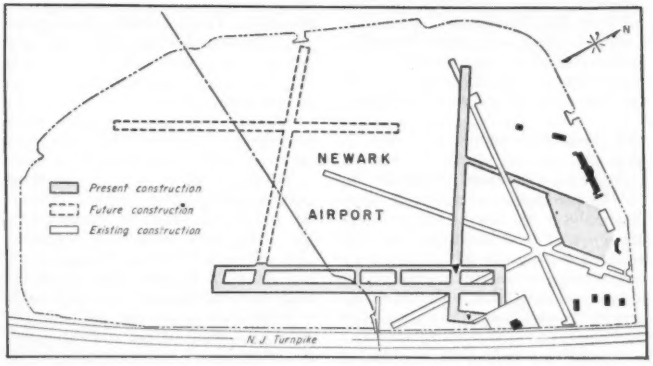
Several new prohibitions and limitations are proposed. The new regulation would eliminate the right to use a DO rating to replace inventory consumed in a construction job. It also would prohibit entirely the transfer of allotments of controlled materials—as distinct from the making of allotments to subcontractors and producers.

Copper tubing and fittings for pipe systems—except in industrial construction—would be prohibited by the new regulation. But this prohibition would not ban the use of such materials if they were in possession of the contractor prior to a date to be set.

Special NPA orders now govern three categories of construction: electric power, oil and gas, and communications operating facilities. To these, the proposed regulation adds two more which are to be placed under new NPA orders—residential construction and water wells.

• **New limitations**—For other categories of construction, the revised regulation would make some changes. Self-authorization limits would remain as they are for industrial facilities. Any other type of non-prohibited project would have to apply for construction authorization if it required in one quarter more than 2 tons of carbon steel (including any structural steel at all) or more than 200 lbs. of copper.

The new regulation also proposes dollar limitations on the use of DO orders for self-authorized projects. On industrial jobs, the limits would be $100,000 for building materials and equipment, and $200,000 for production equipment and machinery—including no metalworking machines.



SUPERIMPOSED on the original three-finger runway system of Newark airport is this set of four new runways; two now under construction and two proposed. They will limit the number of traffic patterns and also will divert takeoff and landings away from the obstructed and congested nearby areas 96% of the time. Directly connected to the newly opened New Jersey Turnpike, the air terminal, which handles over half of the metropolitan areas scheduled air cargo, is a short 20-minute ride from midtown New York.

Home builders warned ceiling on starts of 800,000 is goal of new restrictions

When housing contractors met in Chicago last week, they had fire in their eyes.

By coincidence, the annual convention of the National Association of Home Builders convened one week after mobilizers had announced slashes in materials for home building, and one day after President Truman's budget recommended tighter money for housing.

For the moment it looked as though the housing industry had been singled out by the Administration to bear the heaviest brunt of cutbacks in the civilian economy to keep defense machinery rolling. So the atmosphere at the convention was like that of a charged powder keg.

To smooth things over a little, President Truman sent the convention a letter, and dispatched Housing and Home Finance Administrator Raymond Foley to make a talk.

The letter, read to the opening session by retiring NAHB President William P. Atkinson, summarized the sad news this way:

"Defense needs unfortunately require us to hold down the amount of new housing to be produced, because of our fight against inflation and our need to use critical materials to arm ourselves against communism's world threat."

• **More detail**—Mr. Foley amplified Truman's message in broader detail. Specifically, he said, builders are going to have to scrape through using substitutes to start 800,000 homes this year compared to the 1.1 million started last year.

The 800,000 figure had been agreed upon by government agencies responsible for housing materials control, and stabilization, as an attainable ceiling on starts and is regarded as the maximum that can safely be built under present circumstances," he declared.

(Second-quarter allotments by the Defense Production Administration allow only enough metal for a rate of about 600,000 units.) (ENR Jan. 17, p. 23)

The government has not set any hard and fast limit on the number of houses to be started, but HHFA is getting ready to announce some new restrictions, he said.

They are designed to reduce "substantially" the use of critical materials, "particularly" the use of metals such as copper and brass. And they will take into consideration not only the prospective supplies of materials to be manufactured, but also the amount of these products now in builders' inventories.

RAYMOND FOLEY announced new regulations in the offing.

• **Next speaker**—To clinch the issue, Defense Production Administrator Manly Fleischmann told the convention that the home-building industry is not being treated unfairly in the allotment of materials. He said he had arrived "to spike a rumor" that some industries were being given preferential treatment.

Specifically he said builders are faring at least as well as the automobile industry, which must now get along on 50% of the materials used at peak production levels in 1950. This compares with a 40% cut for home building from the 1950 level.

When the convention closed at week's end, some contractors were less angry than they had been at the opening. And if others were still bitter about Administration policy, at least it had been thoroughly explained to them.

Reaction was mixed. Formally the NAHB pledged its members to cooperate fully in the production of housing in critical defense and military areas, but pleaded for a minimum amount of government controls of the industry during the emergency and prompt termination of them when shortages ease.

A resolution calling for revision of the public housing program charged that it had been sold to the public as a "free federal handout", but had turned out to be a "burdensome expense" to the taxpayer. It opposed increasing the volume of government housing to 75,000 units annually from the current level of 50,000.

• **Enough money?**—The convention suggested government action to improve the mortgage situation. It said lack of financing lately had retarded defense housing work and had compelled people of limited income to forego or delay their purchase of a home.

Its action followed statements from several building authorities that the lack of mortgage money at 4-4½% interest rates might be a more serious limiting factor on the number of homes built this year than the lack of materials. Others predicted, however, that before the year is out investors will be looking for mortgages at 4% and 4½%.

From New York last week, Ben H. Hazen, president of the United States Savings and Loan League, also voiced a protest against the housing cutbacks, stating that the amount of critical material that will be saved will be infinitesimal.

Also from New York, State Housing Commissioner Herman T. Stitchman warned that the cutbacks in materials in tighter credit controls "will bring about the worst crisis in homebuilding as well as in unemployment in the building trades in New York State and in the nation since the end of World War II."

• **Budget background**—The economic story behind the Administration's policy on housing was carefully outlined in Truman's budget proposal last week.

Since the attack on Korea, all government housing and community development programs have been concentrating on meeting the immediate needs of expanded military and defense installations. Total housing construction, Truman said, is being reduced to free materials and manpower for more essential uses and to help stabilize prices and wages in the construction industry.

"Almost a third of the new homes built in the fiscal year 1952-53 will be in areas serving military and defense installations. They will be rented or sold at prices which military personnel and defense workers can afford to pay. Necessary community facilities also will be built in these areas. Federal aid must be given, but it will be held to a minimum," Truman said.

So in the fiscal year 1952-53, expenditures for housing and community development are estimated at $678 million, compared to the $881 million estimated for fiscal 1951-52.

• **More defense homes**—Up to Jan. 9, the DPA had certified a total of 135 areas as critical for defense housing

encompassing 66,715 units. In addition, 4,575 temporary and portable dwellings and trailers had been assigned 23 areas. And new areas are being announced at a rate of six to eight a week.

According to Truman's estimates, roughly 400,000 new housing units should be built or placed under construction in critical defense areas in the next 18 months. As long as private builders continue to do the job, they will get the work, he said. But "in those areas where private builders are unable to provide enough housing of the type needed for defense workers and military personnel and at prices and rents they can afford to pay, the Federal Government will construct such housing directly."

To build these homes, he asked for additional appropriations in fiscal 1952-53 of about $325 million, or which about $25 million is for community facilities.

• **Fewer non-defense homes**—To cutback on non-defense construction, Truman urged Congress to restore authority which previously existed over down payments and other credit terms.

Soon after the attack on Korea, the down-payment requirements on federally insured or guaranteed mortgages and on other mortgages were increased and the repayment periods shortened. This limited construction without resort to direct controls, he said.

The rate of new construction and credit expansion slowed down, but the action of Congress last fall in removing most of the authority for such controls has reversed the trend. Now Truman wants them put back on the books.

He is also holding down on low-rent public housing programs. By the end of fiscal 1951-52, an estimated 140,000 units will have been started under the Housing Act of 1949. For the next fiscal year he recommends 75,000 new starts as compared to the average of 135,000 units a year which had been authorized in the basic statute.

Even urban redevelopment and slum clearance must be limited to those projects "consistent with defense needs", he said. For fiscal 1952-53, new loan commitments are not expected to exceed $100 million, even though the basic statute authorizes $250 million in borrowing authority for the year, with expenditures estimated at $25 million.

• **Believe it or not**—From the NAHB convention, it may come as a surprise to some to learn that most building materials appear to be in adequate supply for the 1952 home building program.

One major exception however, according to Rodney Lockwood, Detroit, Mich., is that all items made from copper—except blass-plated hardware—will be in short supply most of the year.

"Other materials," declared Lockwood, "probably will be quite generally available. There will be no shortage of lumber, lumber products, or manufactured building products generally. Some shortages, however, may be expected in a few steel items; particularly galvanized nails and galvanized steel pipe."

• **Operation Trade-Secrets**—One highlight of the convention was a session devoted to timely tips for cutting costs, conserving materials and speeding construction of housing. Moderated by W. P. Atkinson, of Oklahoma City, 1951 president of NAHB, the 37-man panel came up with the following suggestions:

More packaging of building materials for simple installation in new houses, to reduce labor costs . . . closer work by builders, with their architects and engineers prior to the start of construction . . . more extensive usage of the "storage-wall" as a cost saver . . . greater usage of slab floors and the elimination of basements . . . dry-wall construction where permissible . . . builders on large projects to establish their own concrete plants both as a point of economy and to insure against delays in receiving concrete; also buy instead of rent heavy construction equipment in those instances where the size of the job warrants it.

• **Better houses in '52**—Newly elected president of NAHB is Alan E. Brockbank, Salt Lake City builder. Said he: "The 1952 house will be the best value for the money in home building history, due to recent and current developments in design and construction."

Some of these are: Non-bearing interior walls permitting movable interior partitions; floor-to-ceiling storage walls; floor plans designed for easy expansion; more recessed and indirect lighting; simplified roofs; new types of concrete foundations where unstable soil conditions exist; increased usage of electrical appliances; and the increasing trend toward more built-in labor saving devices.

Other new officers of NAHB include: E. M. Spiegel, New Brunswick, N. J., first vice president; Joseph Haverstick, Dayton, Ohio, second vice president; R. G. Hughes, Pampa, Texas, treasurer; and Paul Burkhard, Glendale, Calif., secretary.

Truman pushes action to authorize seaway

In a special message to Congress Monday, President Truman tried to blast loose committee-bound legislation which would authorize the St. Lawrence Seaway and power project.

It was the second time in a week the President urged prompt congressional action. Last week he urged in his budget message that the project be undertaken as a "strategic necessity."

He said in his message that Secretary of State Dean Acheson has informed the Canadian ambassador that the U. S. will soon approve the 1941 agreement with Canada to build the project jointly.

"At the same time, in order that there may be a minimum of delay in the construction in the event the Congress does not approve the 1941 agreement at an early date, we agreed to cooperate with the Canadians in advance preparations for presenting the matter to the International Joint Commission," he said.

Canadian determination to proceed with the seaway with or without U. S. participation was voiced again last week at a Canadian Construction Assn. convention by Transport Minister Chevrier. (see story on page 46).

Truman's message was referred to the Senate Foreign Relations Committee where Chairman Tom Connally announced "This bill ought not to be passed." Senator Charles Tobey objected and asked assurance that the committee will take an honest vote.

Collapsed cofferdam is rapidly restored

Merritt-Chapman & Scott Corp. estimates that repairs on the Pier 1-E cofferdam which collapsed on the Arlington Bridge project at Jacksonville, Fla., will be completed in time to permit it to be dewatered about Feb. 4.

The repair plan will be along the lines reported in ENR Jan. 24, p. 29. Because of the time element, it has been considered advisable to install a new lower bracing instead of repairing the original. Under water examination showed that the sheetpiles on all four sides of the cofferdam were bent inward, slightly, over the seal.

In accordance with original plans to leave the cofferdam sheetpiling in place to the top of the pier's distribution block, they have been cut off at −22, below the level of the lower bracing now being installed.

To date, not enough information has been developed to determine definitely the cause of the failure of the original bracing. It has been definitely determined, however, that it was adequately designed.

No early armistice foreseen in battle over force-account highway work

By S. T. Henry
Staff Correspondent

Unexpectedly rapid progress in carrying out North Carolina's $200-million secondary-road construction program has highlighted the attacks that highway contractors of the state have for nearly three years made on the force-account policies of Governor W. Kerr Scott and Dr. Henry W. Jordan, chairman of the State Highway Commission.

Soon after proceeds of the sale of the first $125 million in secondary-road bonds were received in 1948 Dr. Jordan, with the approval of the Attorney General of North Carolina and Governor Scott, spent $5 million of the money for machinery and equipment.

A suit was brought by Nello L. Teer, Jr., a leading North Carolina highway contractor, to obtain a court order restraining such use of bond money.

The North Carolina supreme court upheld the lower courts in ruling that the State Highway Commission was within its authority in making such expenditure.

Much of the machinery and equipment was bought, according to Dr. Jordan, to replace obsolete units which the commission had used for many years in highway maintenance and reconstruction work. The balance has been employed mainly in building and keeping up secondary roads. The entire $5 million is being amortized out of gasoline taxes, all of which in North Carolina go into highway funds.

DR. HENRY L. JORDAN wants "the most at least cost."

Soon after Governor Scott and Chairman Jordan began to use the secondary-road bond money it became evident that their policy was to do considerable construction of such roads with the commission's equipment and its own forces. Members of the Carolinas Branch of AGC have taken increasingly bitter exception to this policy.

• **Takes exception**—At a meeting of the North Carolina section of the American Society of Civil Engineers some weeks ago Mr. Teer expressed opinions about this and other policies of the commission with which most of the North Carolina AGC members seem to agree. He stated specifically that "the truth is not told about the highway program of North Carolina", citing these four points which were attributed indirectly to the commission, as untrue:

"1. That the State Highway Department using their own forces and equipment does produce work cheaper than can be done by contractors under the present contract system;

"2. That the State Highway Department using their own forces and equipment does work of equal quality to that of contractors under the present contract system;

"3. That the contractors have more work than they can satisfactorily perform;

"4. That the contractors, being loaded with work, are bidding too high, because they already have more work than they can do;

"5. That the state's estimates of construction costs are fair and equitable."

Mr. Teer went on in his speech to prove to his satisfaction that all of these points are untrue. Interviews with several North Carolina contractors have brought out that their concensus is generally in agreement with Mr. Teer's contentions.

• **Other side**—Neither Governor Scott nor Dr. Jordan have replied to Mr. Teer's published statements. Under certain conditions, these officials are evidently convinced however, that the States Highway Commission can build some secondary roads at lower costs than bids that have been submitted by contractors for such projects. They are proceeding on that basis. But about less than 40 percent of the secondary roads thus far built under the $200-million program have been done with the commission's forces and equipment.

CONTRACTOR Nello L. Teer, Jr. says the state is losing money.

Dr. Jordan states that "my job is to get the most road work done at the least cost to the taxpayers of North Carolina." He will evidently stick to that policy as long as he is in office. And he has the backing of Governor Scott in this position. Governor Scott will be in office until January 1, 1953. The secondary road program will be largely done then.

Mr. Teer submitted in his speech information gleaned from the oft-quoted 1934 report of the Bureau of Public Roads "Construction by Contract and by Day Labor" as documentary proof that items (1) and (2) were untrue. The Bureau of Public Roads recently approved, however, force-account on a federal aid construction job in North Carolina. Nine other states are reported to have done some federal aid construction in 1950 by force account.

Both sides may be expected to maintain their positions in the North Carolina discussion. Moreover, members of the Carolinas Branch of AGC appear to be convinced that Governor Scott and Dr. Jordan intend to increase the amount of secondary road work done by the commission's forces with its own equipment. They point out that more than 100 miles of such work, in one district, which they contend is well located to being done by contract, is about to be undertaken by the commission. Dr. Jordan makes no comment on this prospect. But if he thinks he can get the work done for less by the commission's organization, he will doubtless do it that way. He emphasizes that this has been a

policy of the commission since long before he headed it.

• **Another point**—Mr. Teer in his speech also proved to his satisfaction that the contractors do not have more work than they can satisfactorily perform. Dr. Jordan is assumed to have stated other contractors agree with Mr. Teer. Dr. Jordan has made no public statement on this point. Recent lettings by the commission have attracted about the average number of bidders.

Dr. Jordan says the commission's records show that a number of jobs have not started by low bidders long after contracts were awarded to them. A recent personal survey by Carolina's AGC concludes: "Of 284 active (highway) projects progress on 96 is ahead of schedule time, progress on 72 projects is on schedule, while progress on 116 is behind schedule. Many of the projects now behind schedule are in the beginning stage and will undoubtedly be completed on or ahead of schedule."

Mr. Teer in his ASCE speech went far afield from what began nearly three years ago of a disagreement between that highway contractors with the State Highway Commission's secondary-road building policies. He strongly attacked several other basic policies of the commission. Most of his contentions are similar to those leveled against the late Frank Page, who gained a national reputation, while he was chairman of the first North Carolina Highway Commission, for obtaining low costs.

• **Support seen**—Other highway contractors in the Carolinas are known to support Mr. Teer's contentions very actively. But the general policies of the commission are unlikely to change, since Dr. Jordan is convinced that by following them he can "get the most road work done for the least cost."

Dr. Jordan's friends point out that he is not rigid on the policy of doing road and highway work with forces of his commission, using the state's equipment. They also point out that all primary road construction in North Carolina is done by contract. They further emphasize that Dr. Jordan has refused to permit his organization to undertake the building of roads and streets within municipalities. About $4,500,000 a year of state gasoline tax money was made available by the last legislature for that purpose. Dr. Jordan evidently believes "that sort of work can be done closely specified and properly should be done by contract."

Mr. Teer seems to see in the policies Governor Scott and Dr. Jordan have followed in the state's vast secondary-road construction program "a step toward governmental ownership and management of essential means of production and distribution of goods". Friends of Governor Scott and Dr. Jordan say that the background of both men belies that sort of feat.

Scott points out that two-thirds of the people in North Carolina live on the land under rural conditions. About one-third are full-time dirt farmers, he emphasizes. Another third live in the country and work in town, mainly in the far-flung textile, tobacco and other industries of the state. Scott is confident that two-thirds of all North Carolians are thus interested primarily in secondary roads.

Scott's $200-million program for the improvement of such roads will come close to achievement during his four years in office. The original estimate was eight years. Scott and Jordan are also convinced they will do the job of paving and stabilizing some 45,000 miles of secondary roads within the funds available from the $200-million bond issue. This will include paving about 12,000 miles of such roads, of which more than 9,500 miles already have been paved under this program.

• **Debate open**—Whatever Scott and Jordan may accomplish with their secondary road program, most members of the Carolinas branch of the AGC will evidently remain convinced that their individual organizations could have done the job better and cheaper. But, Mr. Teer stated in his speech, "It is my honest opinion that there never has been and never will be two similar jobs, but if there were, I'd still quote terrific odds that they could not be completed at the same identical cost."

After interviewing many on both sides of the argument, the conclusion may be drawn that neither side is 100 percent right. The State Highway Commission and its engineers have certainly made mistakes. But they are firmly convinced that what they have done in building so much of the secondary mileage with their own forces and equipment has saved the state money. The contractors take exactly the opposite point of view.

Added to the contractors' contentions on costs and results is their very real fear that the State Highway Commission will tend to do more and more of the work under its direction force account. Dr. Jordan meets this fear with the statement that under his administration more than $140 million in highway contracts have been awarded, and that all primary work is done by contract.

NEWS BRIEFS

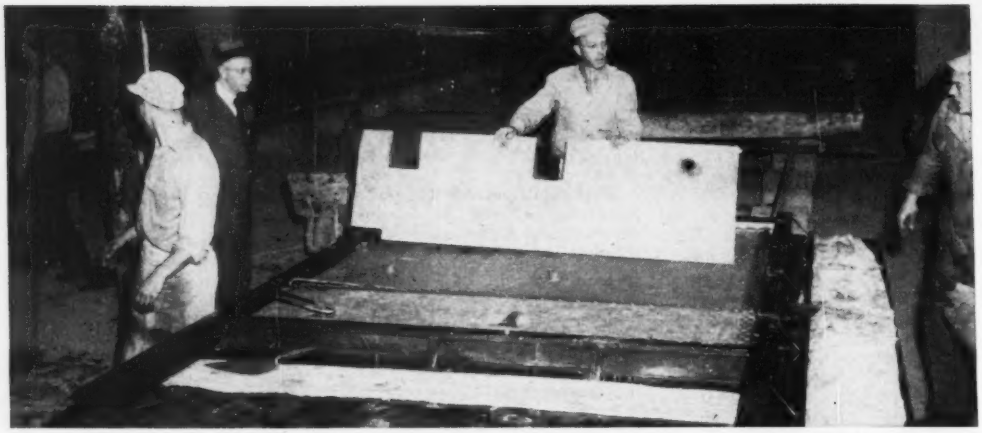
• **Controversial housing**—Arguments, attacks, and counterattacks continue to feature the controversy in Los Angeles over whether or not the city will cancel its agreement for $110 million worth of federal public housing. (ENR, Jan. 10, page 25). Hope for any quick court decision faded when the State Supreme Court met to consider the suit by the City Housing Authority to force the city to live up to the agreement entered into two years ago. The court made no immediate rulings and gave opposing attorney 25 days to file additional briefs. It probably will be months before a decision is forthcoming. Pending the decision, the Los Angeles County Board of Supervisors has complied with a City Council request to put the issue on the June 3 primary.

• **Turnpike sets record**—The New Jersey Turnpike broke the Pennsylvania Turnpike's all-time daily record on the first Sunday that it was open for its full 118-mile length, a reported 59,590 vehicles traveled on the New Jersey Turnpike in a 24 hour period. Tolls amounted to $49,941. The record for the Pennsylvania Turnpike was set last August 19 when 47,080 vehicles used the toll road.

• **Truck weight bill vetoed**—Gov. John S. Fine, of Pennsylvania, has vetoed legislation permitting an increase in truck weights because of the possible "destructive effects" heavy weights could have on highways. Meanwhile, in New York, State Supreme Court Justice Harry E. Schirick upheld the constitutionality of the state's weight-distance tax on heavy trucks.

• **Columbia River compact**—A House Interior subcommittee has recommended that seven western states be authorized to enter into a compact regulating use of the Columbia River and its tributaries. And the Federal Power Commission has refused to reopen a case in which it granted Tacoma, Washington, a license for a hydroelectric project on the Cowlitz.

• **Bridge probe**—The Maryland State Roads Commission and its advisory council last week asked the J. E. Greiner Co., engineers for the Chesapeake Bay Bridge, to review construction of the bridge as a preliminary step in investigation of the structure (ENR Jan. 1, p. 21). Abel Wolman, chairman of the council, said that, after a study of the Greiner report, it will be determined whether further investigation is necessary.



Concrete, insulation and a second concrete layer are combined on production lines for . . .

Sandwich walls precast on rolling forms

R. Neil Christy
Engineer
The Marietta Concrete Corp.
Marietta, Ohio

LARGE WALL PANELS, with built-in insulation, are rolling off the dual production lines of Marietta Concrete Corp.'s new plant at Marietta, Ohio, at the rate of 40 per day.

Concrete for the panels is cast in forms that ride on rails. Various steps in the fabrication of the panels are carried out as the forms move down the 350-ft length of the building.

The wall units now being produced are going into a huge plant being constructed at Marietta for the Electro Metallurgical Co., a division of Union Carbide and Carbon Corp. Over a half million square feet of wall area is included in the present contract. Unit prices range from $2.13 to $2.46 per sq ft, depending on the type of insulation used and size and design of the plant buildings.

• **Thin sandwich**—Typical panels are 8x8 ft or 8x10 ft, only 5 in. thick (ENR Jan. 24, p. 34). They consist of 1½ in. of rigid insulation sandwiched between two 1¾-in. thick layers of wire-mesh reinforced concrete. Inner and outer facings are tied together with expanded-metal shear ties, and edges of the panels are tongue-and-groove, for watertightness. Inserts for anchoring panels to structural steel framing are welded to the inside wire mesh, which holds them in proper position during the casting operation.

Slabs are cast on muslin to produce a textured finish on the interior face. An attractive exterior finish is created by vertical brooming of the concrete before final set.

Concrete is a well graded mix of sand and crushed gravel, with ¾-in. maximum-size aggregate. It contains six bags of high early strength cement per cubic yard, plus an air-entraining agent. Average 7-day strength is over 4,000 psi and the 28-day average, close to 5,000 psi. At regular intervals, entrained air is measured with an air meter; average to date is between 3½ and 4%.

Concrete is batched about ¼ mi from the precasting plant and mixed in transit.

• **Production-line precasting**—Marietta's new plant was designed to fabricate these wall units by mass-production methods, based on experience with an existing plant. With the concrete cast in forms mounted on rails, several crews located along two continuous production lines perform the various tasks without interfering with other operations.

Fabrication starts with form preparation at one end of a production line and terminates with a finished panel rolling off the line at the other end. From there, it is taken to a curing chamber. Average production rate of the two lines is 2,000 to 2,500 sq ft of wall area per 8-hr day. A total of 25 men are employed in the complete operation. (Since panels have to remain in the forms for at least 20 hr, the forms can be used only once per day, making impossible a two-shift operation by present methods.)

To hold panel dimensions to the very close tolerances required by specifications, Marietta uses steel forms. The bottom is made of ⅜-in. thick plate, the sides and ends of rails built up to the shape of the tongue and groove. The rails are fastened to the plate with key bolts at 12-in. intervals.

• **Fabrication steps**—At one end of the 350-ft long plant, the forms are cleaned, then oiled with a parting agent—a mixture of castor and fuel oils. They roll down to a muslin-placing station, where the material is cut from a large roll and stretched over the bottom plate. Here, the side forms are fastened in place, pulling the muslin tight and holding it in position. Here also, the first layer of reinforcing is inserted. One-inch galvanized slab bolsters hold it in place.

Next, the forms are moved under a trolley beam on which is mounted a clamshell bucket that places the concrete. They are vibrated for two minutes with an electric vibrator, which is mounted on a steel framework that supports the rails at that station. Lifting hooks and shear ties are worked into place. Then, the insulation is laid down.

At this station also, the second layer of reinforcing is inserted, and concrete for the outer face cast. The form is vibrated again for two minutes. Concrete is struck off even with the top of the form with a steel screed, after which the surface is smoothed with a large wood float.

At the next station, when the concrete has just begun to harden, the surface is broomed in straight vertical

lines. When it has hardened sufficiently, the forms—now moved to the initial curing area—are covered with wet burlap, on top of which is placed waterproof paper, to retain the moisture.

The next morning, at the far end of the production line, the wall panels are removed from the forms, which then are rolled back to the starting point on a third set of rails. The slabs meanwhile are placed in a vertical position in steam curing chambers. A temperature of 120F is maintained, with 100% humidity.

After 48 hours of curing, the slabs are removed by a pneumatic-tired crane and taken to the storage yard. There, they are laid in an inclined position.

At least 10 days elapse before the panels are ready to be erected. They are transported to the job on semi-trailer trucks. During this move, they rest on wood A-frames, with panel bottom edges set on a strip of insulation, to prevent them from being damaged. Since the panels weigh about two tons apiece, a total of six slabs make a load.

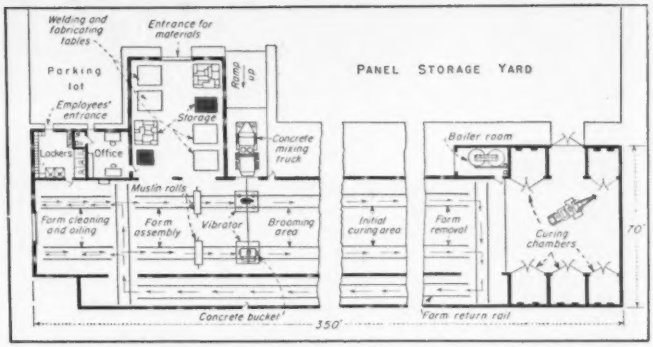
• **Mortarless block walls**—The building housing the precasting operations was built at a relative low cost—$100,000 for about 25,000 sq ft of floor area. (Equipment cost about $50,000.) Furthermore, it took less than two months to construct.

The floor slab—6 in. thick—was laid on the ground and reinforced with 6x6 No. 6 mesh. Its edges were thickened and heavily reinforced to support load-bearing exterior walls.

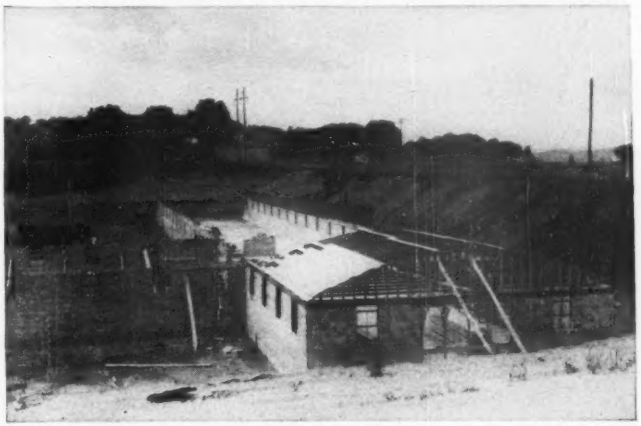
Made of lightweight-concrete hollow blocks, containing expanded-clay aggregate, these walls were built without mortar. Tongue and groove edges and ends form interlocking joints. And after the wall was erected to its full height, ⅜-in. dia steel rods were inserted in the hollows at corners and alongside openings and hooked onto anchor hooks in the floor slab. A metal bearing plate was slipped over the top of the bars and a nut tightened against it until the wall became rigid. The hollows then were filled with concrete.

The wood roof is supported mainly on 40-ft laminated timber arches, spaced 2 ft apart. A shed roof covers the additional width of the building. Arches are light; they were handled easily on the job and erected with ease and speed.

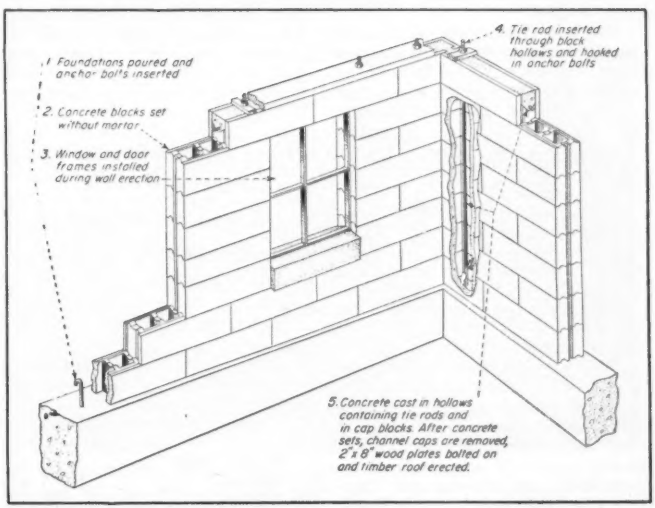
The plant was designed by Marietta Concrete Corp. and erected by W. H. Heiby Co., Marietta, Ohio. P. M. Grennan, of Ford, Bacon & Davis, was consulting engineer on some phases of the precasting of the wall panels.



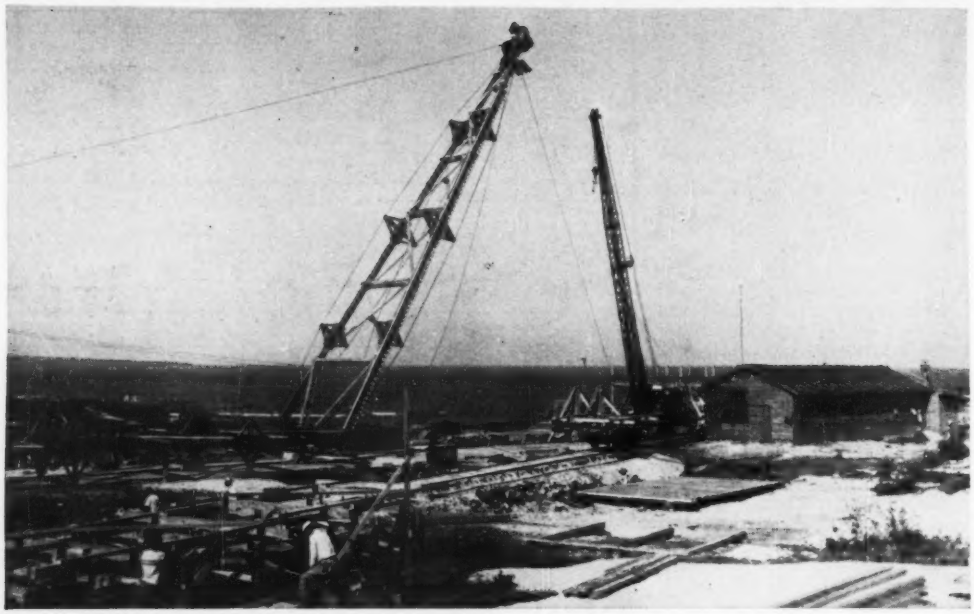
DUAL PRODUCTION LINES extend the length of the precasting plant at Marietta, Ohio. Operations like concrete placing and finishing are performed at various stations.



LAMINATED TIMBER ARCHES support the roof of the precasting plant.


1. Foundations poured and anchor bolts inserted
2. Concrete blocks set without mortar
3. Window and door frames installed during wall erection
4. Tie rod inserted through block hollows and hooked in anchor bolts
5. Concrete cast in hollows containing tie rods and in cap blocks. After concrete sets, channel caps are removed, 2" x 8" wood plates bolted on and timber roof erected.

MORTARLESS BLOCK WALLS reinforced vertically were built in five steps.



CABLEWAY TOWER RISES—Fixed cableways, one on each arch-rib centerline, were the vital tools for building Guiteras Bridge in steep-walled gorge of Canimar River, Cuba. (All photos by H. D. Williamson, Raymond Concrete Pile Co.)

Precision-built falsework and well-organized materials yard make clean job as . . .

Arch bridge construction beats rainy season

CUBA'S VARADARO AREA, described as one of the finest winter resorts in this hemisphere, is much easier to get to this season—the Canimar River has been bridged.

The bridge, which completes a new coastal highway from Havana eastward, cuts off 24 miles of back-country roads. It was completed in less than nine months by Raymond Concrete Pile Co. Mostly a pile-contracting firm in the United States, Raymond tackles just about any kind of job outside the country.

The Canimar River Bridge was one of the best assignments a general contractor could ask for: Good foundations and approaches already in place, and perfect weather for the work—providing the job could be done in the nine months between the rainy and hurricane seasons.

Thanks to full planning, precision-built falsework, production-line techniques and a pair of light cableways that handled almost everything that went into the work, the schedule was met.

A three-span parabolic arch structure (see table, right), the bridge is five miles east of Matanzas. It was designed by Cuban government forces under Jose Menendez.

• **Construction history**—The river piers, supported by deep friction caissons, were built in 1948 by Drilled-In Caisson Corp., New York; subsequently the Cuban government built the approaches and shore abutments. In the latter part of 1950, the Raymond Concrete Pile Co. of South America was engaged to do the spans.

The first falsework-supporting pile was driven Dec. 31, 1950. Seven months later the bridge was open to traffic, and by the end of September the bridge railing and timber falsework removal were complete.

The Canimar River Bridge

Length, overall	973 ft
Spans	3 at 218 ft
Deck-to-water height	115 ft
Arches	
Type	Fifth-deg. parabolic
Pair spacing	26 ft
Length, at springline	208 ft
Height, from springline	88½ ft
Deck	
Roadway width	42½ ft
Sidewalks	2 at 5 ft
Slab thickness	7½ in.

• **Construction Planning** — Behind adoption of a pile supported timber falsework lay an investigation of three support systems:

1. Steel arch-truss centering.
2. Timber arch-truss centering.
3. Pile-supported timber falsework.

Steel could not be delivered in time. Moreover any arch-type centering, to be economical, would have had to be re-used several times.

But necessity of keeping balanced horizontal loads on the river piers would make it necessary to place at least one line of three arch ribs simultaneously. Hence only two uses of arch centering were possible.

The following factors favored adoption of the third system:

1. It could be designed quickly.
2. It could be erected in place with light handling equipment.
3. The same equipment could do the rest of the work.
4. The sequence of construction

loading could be altered to meet material-delivery difficulties.

5. The falsework timbers would have high salvage value in Cuba.

Falsework design was performed by the New York Office of Roberts and Schaefer Co. On the basis of preliminary design, enough timber to get the job going was ordered for immediate delivery. By the time design was complete, materials for full-scale operation were on the job, and equipment was ready to operate.

• **Cableways**—Two independent 1200-ft span cableways were erected, one over the centerline of each row of arch ribs. Stationary timber A-frame head and tail towers were 100 ft high to the 2-in. dia main cable.

One 90-hp boiler powered the cableways' two 8x10-in two-drum hoists, which operated the carriage at 600 ft. per min. A telephone system with plug-in connections on the falsework handled cableway signalling.

• **Pile driving**—During cableway erection, in January, a job-made floating pile driver set 206 80-ft piles in 14 ft of water to support the falsework. Seven-pile bents had 12x12 caps and were located 14 ft apart, at panel points of the falsework.

• **Falsework**—On January 31 the cableways worked together to place the first fully assembled bay of falsework on a pair of pile bents. Similar bays were installed in each span to start the lowest lift of falsework. After that, smaller frames and pieces, to complete the lowest lift and to form successive lifts, were placed individually by one cableway or the other.

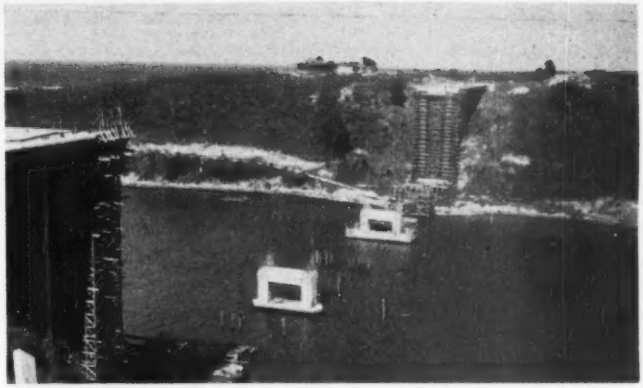
First-stage bay assemblies weighed 9 tons. Twenty-six feet high, they were spotted carefully so that subsequent frames would be in proper position. The second lift was 32 ft high and the third was 18 ft high. This lift had intermediate support points for screw jacks that supported cross-trusses of the fourth lift. These trusses cantilevered 10 ft both ways at their tops, to support overhang of roadway and sidewalks. (Another set of jacks, for arch decentering, also was a part of the falsework.)

Throughout, falsework consisted of 8x8-in. columns, with 3x8-in. horizontals and 3x6-in. diagonal braces, spliced and bolted with steel ring connectors. Bents were 36 ft wide, each with five columns.

The falsework was considered stable enough for ordinary wind stresses, but not for hurricanes, which could be expected in September.

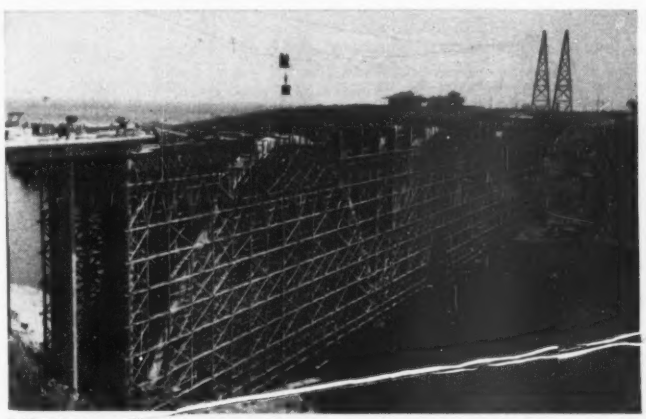
Falsework also was designed for two stages of construction loading:

1. The arch ribs and spandrel col-



WHEN WORK STARTED—Raymond's job was to build a three-span arch bridge on existing supports and between existing approaches. Piles remain from a previous attempt to build the arches.

FALSEWORK ASSEMBLY BEGINS—After removing old piles, contractor drove 80-ft wood pile in bents spaced same as falsework posts. First falsework bay, weighing 9 tons, is ready to be placed.



RIBS COMPLETE, columns nearly complete, the next step is to de-center ribs so falsework will take deck construction loads only. Hole in center span allows small vessels to pass under work.

umns, which were to become self-supporting with the first de-centering.

2. The deck.

A comparatively light structure resulted, containing about 800 Mfbm of short-leaf yellow pine, and imposing about 20 tons on each timber pile.

As falsework progressed it was possible to place the first rib forms early in March. This in turn permitted the installation of rib steel.

• **Concrete**—The controlling factor in concrete was the requirement that concrete in all three ribs of each row be carried up at the same time, in order to balance longitudinal forces on the falsework, and to balance the thrust on river piers. Also, the crown was to be poured before the adjacent haunch sections.

Coordination of falsework erection, side and top form re-use, and steel placement, together with concrete plant and cableway capacities, made it possible to keep downstream concreting only a week behind upstream concreting throughout the job.

The first rib concrete was placed March 31; the last on May 16. During this time of peak activity as many as 237 men were on the job.

While the ribs still were curing on the falsework the spandrel columns were placed, again with an eye to proper balance.

• **Decentering**—To prepare for the second, or deck, stage of falsework use, the arches and columns were decentered on June 6. The operation required a full shift, 30 men working a total of 540 jacks. There were five jacks at each of 18 jacking levels in a half arch, so five men went downward each way from each of the three crowns, at given signals simultaneously lowering their jacks a half turn. This was repeated until the jacks were all free. Three passes were sufficient.

• **How arches behaved**—Instrument readings near the crowns were taken throughout the day to observe the effect of the operation. Although there was movement of the crowns downward, then upward as the release of jacks preceded down the haunch, the net effect was within the range observed due to daily temperature variation.

• **Crown jacks**—The decentering operation's negligible effect probably was aided by an unusual feature of crown closure. At the top of each rib a 2-ft gap was left in the concrete. Here four 100-ton hydraulic jacks were inserted to provide crown thrust. Two days before decentering, 40-ton thrusts were placed in each crown. Shrinkage effects as well as some plastic flow and elastic deformation in this way were more or less overcome before decentering was complete. The discontinuity, with only the jacks carrying the thrust, remained until the deck, also discontinuous at the crowns, was complete.

• **Deck construction**—A balanced pouring schedule also was necessary for the deck system, because it was felt that under some conditions the falsework would not carry the whole load:

1. Temperature variations caused vertical arch movement.

2. Wetting and drying caused expansion and shrinkage of the falsework columns.

In an unfavorable combination of these factors (rising arch, shrinking falsework columns) deck construction loads might go partly through spandrel columns and into the unsupported arches.

On June 7 the deck falsework was ready for form erection. Concreting began July 2, proceeding at two 27-ft panels a day (24 panels) to completion July 15.

Deck decentering took place on July 20, when a test cylinder showed 3,000 psi strength.

• **Crown closing**—Before decentering, arch thrust in crown jacks was 240 tons. This showed that much of the deck load already was in the arch rib. After decentering, the crown thrust was pumped up to a design figure of 325 tons. This load was transferred to short thrust beams and the jacks were removed. Main arch steel was made continuous through the crown by butt-welding filler pieces across the gap. All three gaps were closed with high-early concrete on July 25, three days before traffic was allowed on the bridge.

• **Falsework removal**—On August 1, a 17-ton truck crane began removing falsework frames and pieces, passing them to the cableway for transportation to a salvage yard. After removal of falsework and pile caps, piles were removed by breaking them off at their splices (16 ft below river bottom).

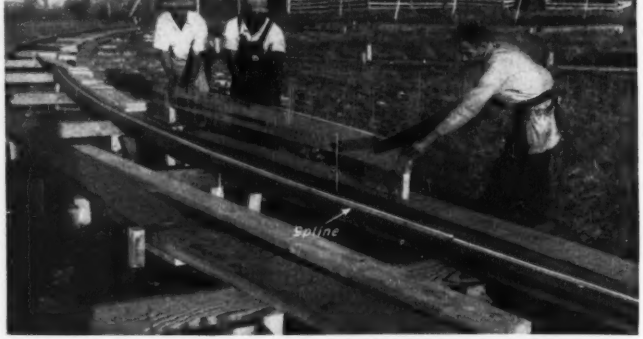
Handrail construction (after falsework removal), a bituminous concrete roadway surface and some approach grading finished the job well before the first expected autumn storm.

Efficient contractor's yard feeds bridge materials

Supporting the tight-schedule bridge work was a masterpiece of logistics. Material deliveries were well-timed and the material fabrication and assembly yard was organized efficiently.

• **Timber fabrication**—The timber fabrication yard had a normal inventory of 200 to 300 Mfbm, delivered by truck from Havana. Timber lengths had been ordered on the basis of a carefully prepared cutting list. Each column, brace, splice block, etc. was marked with a code number.

Master templets of end cuts and bolt layout were made for each code number and a production line



ARCH PATTERN—Laid out to computed coordinates in level field, this pattern has a spline piece set into it at precise position for outside of arch-bottom forms. Carpenters shape an arch-form stringer templet.

method of cutting, boring and grooving members was followed. Because the work involved prefabrication of standardized members, using bolts and ring connectors, it was necessary to meet tolerances common to steel fabrication.

Regular production drilling was done by job-built, pneumatic-powered drill presses. Six drills, working two shifts daily, were required to drill 8000 holes in the timber required for one erection shift.

• **Timber assembly and erection**—Next to the drilling yard was an elevated open rack on which the prefabricated members were assembled into two-column braced panels. These panels were slid onto a small railroad car and pushed about 200 ft by hand to a storage area beneath the cableways.

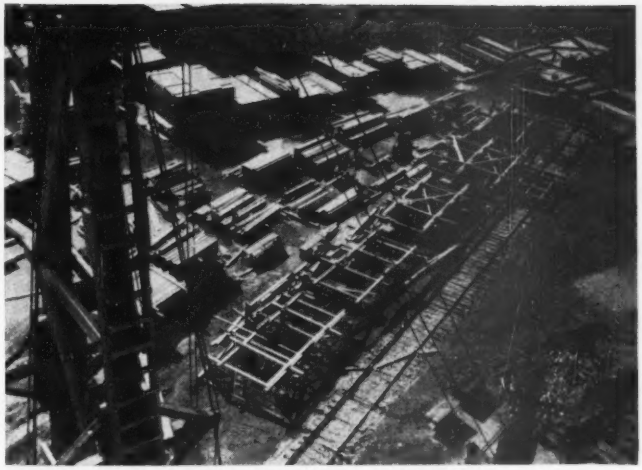
The panels, together with bundles of code-marked cross braces, were carried out to the erection crews by the cableways. Isometric sketches of the code-marked assemblies served the assembly and erection crews and eliminated the necessity of much measuring. Moreover, the wrong piece simply would not fit, so there was constant control on both horizontal and vertical layout.

One special layout and boring crew, with a seventh drill press and molding platform, took care of special framing, such as that required around the 40x40-ft opening left for navigation through the center span, and that for the radial framing that supported the screw jacks carrying the archrib form and construction.

• **Arch forms**—After falsework fabrication was well started, a full-sized master layout frame for half of an arch rib was made in a level area near the form-building yard. Three parallel lines staked off at one-meter intervals were control for the layout. From these lines right-angle coordinates (computed) were measured to establish the intrados and extrados curves on the master layout frame.

Splines were fitted to these points and permanently fixed to the frame. Points for transverse beams, columns and column pedestals were located likewise. In addition, all cuts for bottom form stringers and panels, and side and top form panels were laid out. Carpenters made master templets matching the master layout.

• **Reinforcing steel**—Reinforcing steel was received by truck from railroad cars in Matanzas. As bars were unloaded, they were stacked in matched-end piles, by sizes and separated into layers with buck boards at the ends. This careful stacking made it possible to do all cutting in the storage pile, saving one handling of steel.



FABRICATION YARD—Frames for falsework are assembled from precision-cut and drilled timber on racks alongside the track behind cableway towers; they are moved onto cars and rolled to point where cableway picks them up.

STEEL YARD—Raymond spent a little extra to stack bars carefully with ends lined up. Then when bars of a certain length were needed, a chalk line (foreground) showed acetylene-torch men where to make the only necessary cut.

• **Concrete plant**—The concrete plant, at roadway level near one approach, consisted of a 100-ton 3-compartment batch bin, weighing batches to a 28 S mixer. Bagged cement came from Havana. Coarse aggregate came by truck from a limestone quarry about 50 miles away. A silicious sand came by rail and truck, 150 miles from Pinar del Rio province. There was fresh water a half mile away.

The bins and cement platform were loaded with 70-ft-boom crane. Concrete was transported in one-yard bottom dump buckets, first on a shuttle car pulled by a railroad scooter car about 70 ft to the cableway, and then by the cableway to the point of deposit. For deck concreting a chute was attached to the underside of the bucket.

• **Job personnel**—Key Raymond people on the job were Arthur Fertell, project manager, C. A. Sutherland, superintendent, Duff Williamson, chief engineer. (Mr. Williamson supplied photographs and information for this article).

Manuel Ray was resident engineer for the Comision de Fomento Nacional, the contract-awarding agency. Dr. Carlos Hevia is its president.

Gantries save money on concrete prison wall

Phillip R. Jackson
Chief Engineer
Wexler Construction Co.
Brookline, Mass.

BY INVESTING in a set of gantries and mechanically operated steel forms the Wexler Co., Brookline, Mass. has saved substantial labor costs in the construction of a long prison wall.

The wall, 4,800 ft long, surrounds a new state prison site at Norfolk, Mass. It tapers from 7 in. at the top to 14½ in. at a point 24 ft down, the overall height varying from 24 ft to 39 ft.

Taking 24 ft as the height to be built by mechanically operated forms, the company first built 2 x 6-ft footings and a stub wall of varying height up to the level 24 ft below top-of-wall. Then the area around the stub was filled to provide a construction road and a foundation for the gantries.

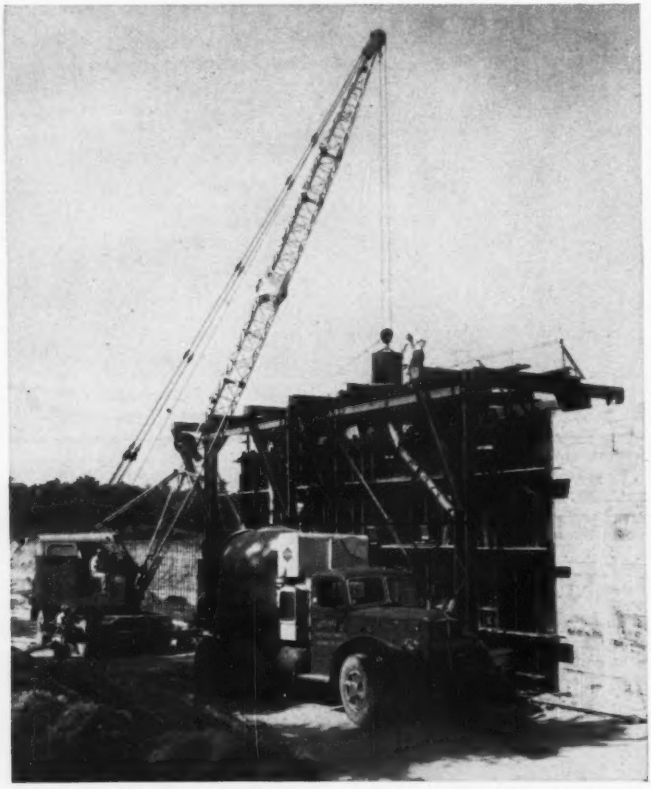
Four gantries were made for the job. Carrying front and back form panels 24 x 30 ft, they were operated in pairs. Each pair produced 60 ft of wall per pour. Form panels were suspended from the gantry frames by screw-jack hangers that traveled transversely on the gantry frames. This travel allowed forms to be pulled away from the concrete when they were stripped.

Wheel-mounted, the gantries traveled on 44½-lb steel rails that were spiked to 30-ft 6 x 12-in. longitudinal sleepers. The sleepers rested on short 2 x 4 ties. Rails and sleepers were handled by crane, being set in position and spliced to adjacent rails.

In preparing for a pour, forms were positioned and tied with ¾-in. cone screw ties. Two hoppers and elephant trunks were mounted on each 60 ft of form work. There were six pouring doors in each of two levels. Transit-mixed concrete was hoisted to the hoppers in one-yard buckets.

When a length of form was stripped, the gantries were ready to roll ahead, hauled by two hand winches on the leading gantry frame. These winches were deadmanned ahead on the track. The move took 25 minutes. As the move proceeded, men stood by the already-set reinforcing steel for the next pour and sprayed the form surfaces with oil.

One form was positioned and all electrical equipment and other inserts were placed. Then the other form was moved transversely on its hangers, into place. An electrically-operated impact wrench tightened up the form-tie bolts, speeding up this task.



ROLLING FORMS—Gantries riding on rails carry two pairs of 24 x 30-ft forms to build Massachusetts prison wall.

• **Vibration a problem**—One of the biggest problems to overcome was that of vibration. At first an attempt was made to use the four electric hammers with suitable pads against the outside of the forms. This proved inefficient and costly. Large sections of honeycomb showed up in the first wall section because of poor vibration.

The next move was to try internal vibration with gasoline spud vibrators. This was abandoned because the vibrators couldn't be handled easily on the narrow top of the forms.

Finally internal vibration with two electric rigs was adopted. The vibrators had small heads that could get anywhere in the deep forms, and the generator could be left on the ground. Honeycombing and sand-streaking were eliminated.

• **Savings**—The Wexler Company found the investment in gantries and mechanically operated forms more than paid off, through a large saving in labor cost. A crew of 20 men, some of whom also were engaged in building guard towers, did the whole job. About fifteen were on walls exclusively. When the job was rolling, one 60-ft section was placed daily, on alternate gantries, making 300 ft of progress weekly.

Architects for the Norfolk Prison addition were Ganteaume and McMullen, of Boston. Col. Maxwell B. Grossman, Commissioner of Correction, was the state's representative in charge of the work. Louis Jacco was resident engineer and Murray Dash was project superintendent.

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KANSAS CITY, KANSAS

Quindaro Plant

(Expansion of Water Purification Plant completed in 1951)

BURNS & McDONNELL
Consulting Engineers
Kansas City, Mo.

R. J. DUVALL
Manager of Production and Distribution
Kansas City, Kans.
Quindaro Plant

Omega Water Works Equipment furnished for the Quindaro Plant:

- **1 — Rotolock Feeder with mixing chamber and dust collector for feeding carbon**
- **3 — Belt Gravimetric Feeders with lime slakers and chart recorders**
- **3 — Belt Gravimetric Feeders with stainless steel dissolving chambers and chart recorders for feeding alum**

Under the management of the Board of Public Utilities of Kansas City, Kans., this major water purification plant supplies the water requirements of 175,000 people in the city proper and in adjacent areas within the State of Kansas. Recent major improvements include expansion of water settling and treatment facilities with a view to bringing plant capacity ultimately to 50 MGD. At present the Quindaro Plant has a maximum capacity of 38 MGD. It treats raw water, drawn from the Missouri River, by means of settling, flocculation, chemical treatment, and filtration.

Important operating aids in the new plant are the Omega Chemical Feeders and recording instruments, purchased under the Engineers' specifications and installed by S. Patti Construction Company of Kansas City, Mo. These feeders are operated under the direction of Elmer E. Chapman, Plant Superintendent, and A. W. Rumsey, Chemist of the Quindaro Plant.

For complete information on Omega Water Works Equipment, address Omega Machine Company (Division of Builders Iron Foundry), Providence 1, Rhode Island.

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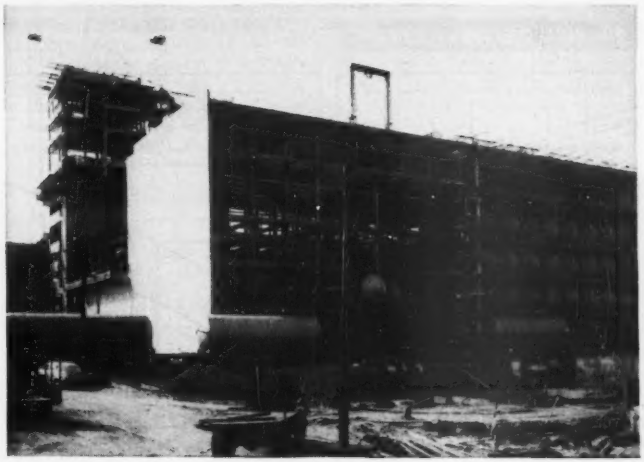
PASTEURIZER weighing 56 tons was installed with two cranes.



GLASS-LINED TANKS weighing about 18 tons were installed in Newark, N. J., brewery with a 115-ft high shear leg.

Big brewery—a complex job erected fast

L. F. Giblin
formerly Project Manager
George A. Fuller Co.
New York, N. Y.

Erection time for Anheuser-Busch's new brewery in Newark, N. J., was cut from an originally scheduled 26 months to 15 months. This achievement is remarkable in view of the size and complexity of the plant.

Having an annual capacity of 1,250,000 bbl of beer, it is one of the largest breweries ever built.

It could not be put together with standard uniformity. It contains a maze of process piping and is full of intricate, heavy, but delicate machinery. These had to be laid out, both in plans issued for construction purposes and in the field, where more accurate and detailed planning was required. Installation of the equipment was particularly tricky.

• **Many buildings in project**—The plant consists of a brew house and tower, grain storage elevator, three "cellars" buildings (all cork-insulated for yeasting and aging), and a bottling and racking plant. Included also are a power plant, oil-storage farm and many underground services. All structures are supported on concrete piles.

Construction required 500,000 cu yd of earthwork, 65 miles of piles, 45,000 cu yd of concrete, over 10,000 tons of steel, more than 5,000,000 bricks and tiles, 50 miles of pipe, 6 acres of roofing, 2½ mi of railroad siding and 6 acres of walks, pavements and driveways. The work was handled by 36 subcontractors, and as many as 1,600 craftsmen worked on the job in a single day. Expenditures sometimes exceeded $2,000,000 a month.

• **On-the-job meetings helped**—A limited time was allotted to the architects and engineers for getting out plans and specifications, requiring extraordinary speed on their part. Of necessity, plans had to be fed to the job piecemeal. This called for extreme care in field checking by all trades to avoid mistakes. It also meant rapid dissemination of information on the job.

• **Machinery installed gently**—Methods for handling some of the heavy equipment to be installed called for considerable ingenuity. Glasslined tanks, for example, were 12 ft in diameter and 42 ft long. They weighed about 18 tons.

The entire side of the building was left open to receive the tanks. To hoist them to the proper floor, a shear legs 115 ft high was set up alongside the building, extending 15 ft beyond the roof. As each tier was filled, the shear legs, mounted on timber skids, was shifted to adjoining panels.

Brought to the open face of the building on a flatcar, each tank was lifted off the car by the shear leg. It rested during the lifting operation in two slings from the main hook. In addition, "belly bands" were rigged at each tier.

The tank was hoisted slightly higher than its tier, turned 90 deg and nosed into the building by booming the shear leg up. The belly band was brought up taut on the outer end of the tank, and the inner end was allowed to rest on rail-mounted dollies. Hoisting ropes were then slackened, causing the pull on the belly band to roll the tank farther into the building. After a few repetitions of the cycle of tightening the belly band and slackening the hoisting ropes, the tank was far enough into the building for a set of dollies to be inserted under its outer end. At this stage, lifting gear was removed, and the tank was pulled into its final position with hand tackle and winch.

Various rigs were used for installing other equipment. Heaviest lift was a pasteurizer weighing 56 tons. This was installed with two crawler cranes with high booms working at opposite ends of the machine. After one end was skidded into the building, the crane at that end was released, the other crane supplying the needed support until the pasteurizer was pulled completely into the building.

The project was supervised by R. E. Hardy and John Kenneth Hyatt, chief engineer of Anheuser-Busch, Inc., St. Louis, Mo. Harley, Ellington and Day, of Detroit, Mich., were architect-engineers. George A. Fuller Co. was the general contractor.

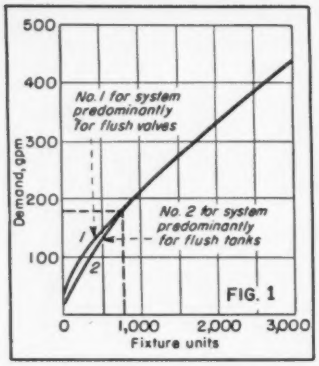


FIG. 1

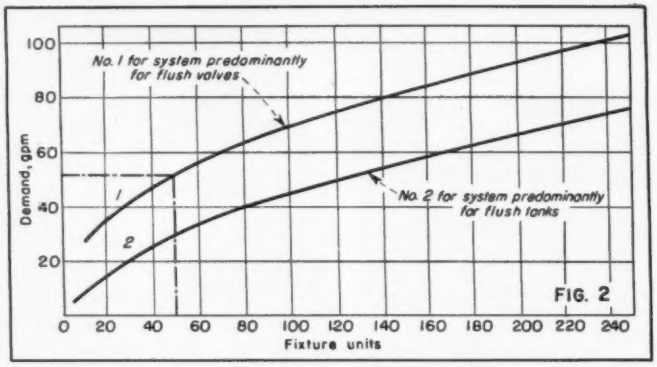


FIG. 2

Probability curves for peak flow in domestic water systems are key to . . .

Saving metal by better plumbing design

James H. Gilhooly
Consulting Engineer
Beacon, N. Y.

MANY ENGINEERS are still determining pipe sizes for hot, cold and circulating-water systems by the equivalent-area method. This frequently is wasteful. Smaller pipe sizes could be used in most cases by more exact computation of the diameter required to supply the needed amount of water at proper pressure.

Peak flow can be estimated with sufficient accuracy, for all practical purposes, from the probability curves (Fig. 1 and 2) developed by Roy B. Hunter of the National Bureau of Standards (Reports BMS 65, 66 and 79). The method has been tested for peak load in several large buildings. On the average, it has indicated flows only 1% greater than the maximum consumption registered by water meters in those structures.

• **Design theories differ**—The equivalent-area method is based on the assumption that all fixtures in a building are operating at full capacity simultaneously, to produce maximum flow in all the pipes.

Starting at the discharge end of a line, the designer specifies the minimum-size pipe capable of serving adequately the fixture there. To determine the size of pipe needed to supply this minimum-size pipe, the designer adds together the cross-sectional areas of the pipes branching from the supply pipe at the same point as the minimum-size pipe. The area of the supply pipe must be equal to or greater than this sum.

In a similar manner, the designer works back toward the main, determining at each point where branches take off the equivalent area of the branches and specifying a supply pipe of equal or greater area.

This method is wasteful. Since most plumbing fixtures are operated intermittently and generally only for short periods of time, the probability

TABLE I—EQUIVALENT PIPE LENGTHS FOR VARIOUS FITTINGS—FT

Dia of Fitting Inches	90 deg Std. El	45 deg Std. El	90 deg Side Tee	Coupling Str. Tee	Gate Valve	Globe Valve	Angle Valve	Strainer
⅜	1	0.6	1.5	0.3	0.2	8	4	12
½	2	1.2	3	0.6	0.4	15	8	23
¾	2.5	1.5	4	0.8	0.5	20	12	30
1	3	1.8	5	0.9	0.6	25	15	38
1¼	4	2.4	6	1.2	0.8	35	18	53
1½	5	3	7	1.5	1.0	45	22	68
2	7	4	10	2.0	1.3	55	28	83
2½	8	5	12	2.5	1.6	65	34	98
3	10	6	15	3.0	2.0	80	40	120
3½	12	7	18	3.6	2.4	100	50	150
4	14	8	21	4.0	2.7	125	55	188
5	17	10	25	5.0	3.3	140	70	210
6	20	12	30	6.0	4.0	165	80	248

Note: For recessed threaded fittings and streamlined soldered fittings one half the above allowances will be ample.

TABLE II—DEMAND WEIGHT OF FIXTURES IN FIXTURE UNITS

Fixture	Occupancy	Supply Control	Fixture Units
Water closets	Public	Flush Valve	10
"	"	Flush Tank	5
"	Private	Flush Valve	6
"	"	Flush Tank	3
Urinal	Public	Flush Valve	5
"	"	Flush Tank	3
Lavatory	"	Faucet	1.5
"	Private	"	0.75
Shower Head	Public	Mixing Valve	3
"	Private	"	1.5
Kitchen Sink	School	Faucet	3
Stop Sink	"	"	2
Bathtub	"	Mixing Valve	1.5
Laundry Trays	"	Faucet	2
Wash Sinks	"	Mixing Valve	2
Dishwasher	"		5

is very small that all will be used simultaneously.

In Housing and Home Finance Agency Research Paper No. 15, "Fixture Unit Ratings as Used in Plumbing System Design" (obtainable from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., for 15 c), Herbert N. Eaton and John L. French, of the National Bureau of Standards, give a good example: Operation of a flush-valve water closet imposes a demand load for a period of 9 sec. Since field observations show that a given water closet may be flushed on the average once in 5 min, or 300 sec, a particular water closet loads the system only 9/300, or 3%, of the time.

Expressed somewhat differently, at any given instant, only 3% of the water closets in a building probably will be operating. Hence, it is absurd to design the water pipe to take care of the load caused by simultaneous operation of all the water closets.

The theory of probability offers a logical solution to the problem of determining the demand load for which a system should be designed. If, from observation, the maximum frequency of use of a particular fixture is known, together with the duration of the period of operation, then, on the assumption that each type of fixture is used at random at this frequency, the probability can be computed of finding 0, 1, 2, 3 . . . n of these fixtures flushing at any given instant. This is equivalent to saying that we can compute the proportion of the time that any given number of these fixtures will probably be found operating.

Hunter's curves (Fig. 1 and 2) are based on this theory. But they incorporate the further assumption that the system will be adequately designed if it can handle the demand load for such a number m of the n fixtures in the building that more than m fixtures probably will not be found in use simultaneously more than 1% of the time.

In using the probability method, peak load is first estimated in terms of fixture units (Table II). A fixture unit is a rating given to a specific kind of fixture, on an arbitrary scale, for the purpose of expressing the loading effect of this kind of fixture on the system. It has no absolute significance, only a relative one.

Next step is to convert the fixture units to demand flow in gallons per minute with the probability curves (Fig. 1 and the enlarged portion of Fig. 1 shown in Fig. 2).

Pressure required at the fixtures is generally known. This added to the static head gives the net pressure to be supplied. Subtraction of the net pressure from the pressure at the main yields the permissible pressure loss due to friction in the pipe. This, in turn, can be expressed in terms of friction loss per 100 ft length of pipe, for use with Fig. 4. Finally, for the estimated peak flow and the computed friction loss, the required size of pipe,

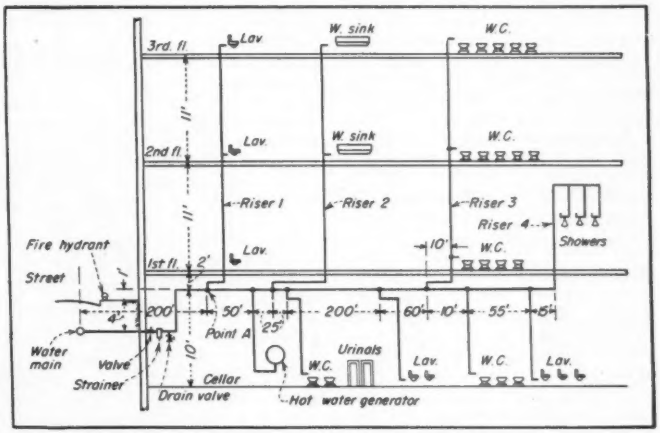


FIG. 3. PIPING LAYOUT for small factory. Pressure at main is 50 psi.

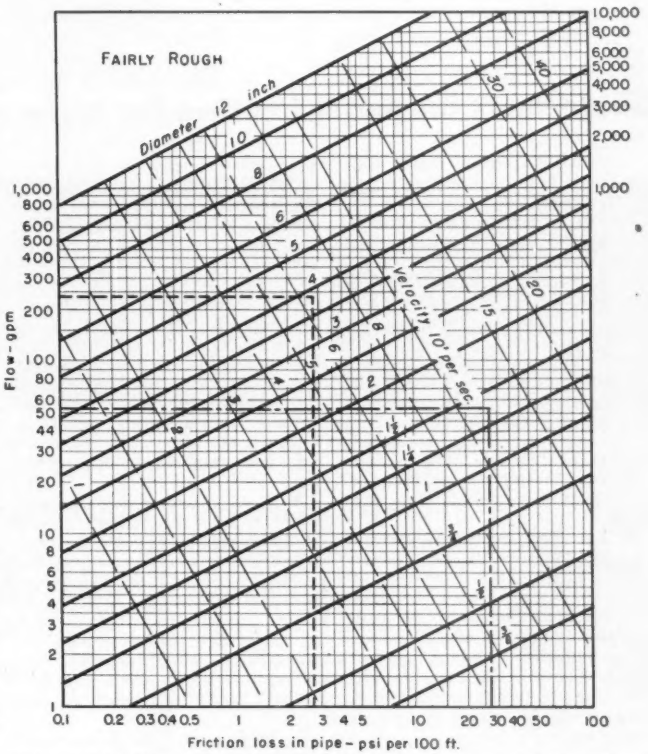


FIG. 4. CHART gives the size of pipe needed for various flows and friction losses. Pipe assumed is fairly rough, galvanized wrought iron.

as well as the velocity of flow, can be obtained from Fig. 4.

• **Example 1**—Find the minimum size of pipe to supply a factory (Fig. 3) having 50 water closets with flush valves, 25 urinals, 60 lavatories, 20 showers, 5-gpm automatic dishwasher in a cafeteria and 50-gpm cold-water process. The highest fixture in the building is 30 ft above the source and 600 ft away from it. Galvanized wrought iron pipe is to be used. Pressure at the main is 50 psi.

Solution—The number of fixture units can be taken from Table II: For water closets, $50 \times 10 = 500$; for urinals, $25 \times 5 = 125$; for lavatories, $60 \times 1.5 = 90$; and for showers, $20 \times 3 = 60$. Total equals 775 fixture units. From the probability curve (Fig. 1) for flush valves, the peak flow is estimated at 180 gpm for these fixtures. Note that dishwasher flow is not included in this calculation, since probability theory does not apply to it.

To obtain the total peak flow, the 5-gpm for the dishwasher and the 50-gpm for the cold-water process must be added to this figure. The pipe must, therefore, be capable of supplying 235 gpm.

Equivalent length of pipe from main to highest fixture is 600 + 200 for fittings (Table I), or 800 ft.

Static head is $30 \times 0.434 = 13$ psi. Since the pressure needed to operate the flush valves is 15 psi, the total pressure required in the pipe is 28 psi. Hence, the allowable friction loss is $50 - 28 = 22$ psi, which is equivalent to $22 \times 100/800$, or 2.75 psi per 100 ft of pipe.

The size of pipe is given by Fig. 4. For a flow of 235 gpm with a maximum friction loss of 2.75, minimum diameter of pipe is 4 in. (intersection of dash lines). The diagram also indicates that with the required flow, the velocity will be about 6 ft per sec. (Velocities up to 15 ft per sec are allowable.)

Required size of branches can be determined in a similar manner. In these lines, however, the limiting velocity is 10 ft per sec.

• **Example 2**—Determine the size of pipe for the first branch, which serves a toilet room 60 ft (equivalent length) from Point A (Fig. 3). Fixtures to be served are three water closets, three urinals and three lavatories.

Solution—Through the use of Table II, total fixture units are found to be 50. From Fig. 2, the probable peak flow for flush-valved fixtures is found to be 53 gpm.

Pressure drop from the main to Point A will be $200 \times 2.75/100$, or about 5 psi. Hence, the pressure at A will be $50 - 5$, or 45 psi.

As before, the static head is 13 psi, and pressure to operate the fixture valves is 15 psi. Thus, the allowance for friction loss in the pipe is $45 - 28 = 17$ psi, equivalent to $17 \times 100/60 = 28$ psi per 100 ft.

From Fig. 4, for a flow of 53 gpm and a friction loss of 28, the minimum diameter of the pipe should be 1½ in. (intersection of dash and dot lines). The velocity would be just about 10 ft per sec.

If the equivalent-area method is used, a 2½-in. pipe would have to be used instead of a 1½-in.

• **Pipe for other systems**—Hot water piping may be estimated in a similar manner. In this case, however, the supply pressure is that at the hot-water storage tank. Use of the probability curves instead of the equivalent-area method results in a load reduction of 50% on the boiler or heater.

In circulating systems, the return line is always one size smaller than the supply line.

Some facts on panel heating for snow melting

At what temperature should water circulating in a snow-melting system be maintained? This is one of the questions most frequently asked by engineers, according to the A. M. Byers Co., Pittsburgh, Pa.

The answer to this question, according to this company, is that when the pipe is embedded in a 6-in. concrete slab, a water temperature of about 140 F is satisfactory. When the pipe is not embedded in the slab, but is placed underneath, a higher temperature is needed—160 to 170 F.

• **Other questions**—and their answers:

Q. May the pipe be embedded in a bituminous mix instead of in concrete?

A. Yes. The assumption that hot pipes might soften the mix is not warranted, since the slab will undoubtedly undergo even higher temperatures when exposed to the summer sun. It should be noted, however, that a bituminous material does not have as high a heat-transmission factor as concrete, so that complete snow clearance calls for spacing of pipes no more than 12 in. apart.

Q. When the pipe is embedded, what is the necessary slab thickness?

A. With a bituminous slab, it is recommended that at least 2 in. of surfacing be over the pipe. Where heavy loads are anticipated, 3 in. or more is recommended. Concrete slabs should have at least 2½ in. over the top of the pipe. This will minimize formation of hairline cracks and also result in a more even heat transfer to the surface. It is suggested that a minimum of 1 in. of material be allowed below the pipes, whether the material is concrete or bituminous.

Q. Is an antifreeze solution necessary?

A. Some means should be employed to keep the heating medium from freezing when the system is not in operation. A 40% solution of a permanent-type (ethylene glycol base) antifreeze and water is suggested to prevent freezing. There is an increasing use of light oils to replace the water-ethylene glycol solutions, but not much is known about their performance over a long period of time.

Q. How much fill is necessary below the slab?

A. This varies, but under normal conditions 4 to 6 in. of fill should be sufficient. Where ground conditions do not permit good drainage, or where there is a high water table, a deeper fill should be used. Fill should be of crushed stone, washed gravel or similar materials. Cinders and other sulfur bearing or acid-producing fills should be avoided.

Q. For what snow-melting rate are most snow-melting systems designed at present?

A. Under almost all conditions, a melting capacity of 1 in. per hr is adequate.

• **Costs**—Case studies of snow-melting systems are given by T. Napier Adlam, vice president, Scaro Mfg. Corp., in his book, "Snow Melting" (The Industrial Press, New York 13, N. Y.). On the basis of these studies, he claims that these systems can be built for $1.10 to $2.85 per sq ft, depending on the snowfall rate to be handled. Based on length of pipe, the systems may cost from $0.24 to $0.60 per ft of run, depending on pipe size. Operating costs for a heavy storm should be in the neighborhood of 6¢ per 1,000 sq ft.

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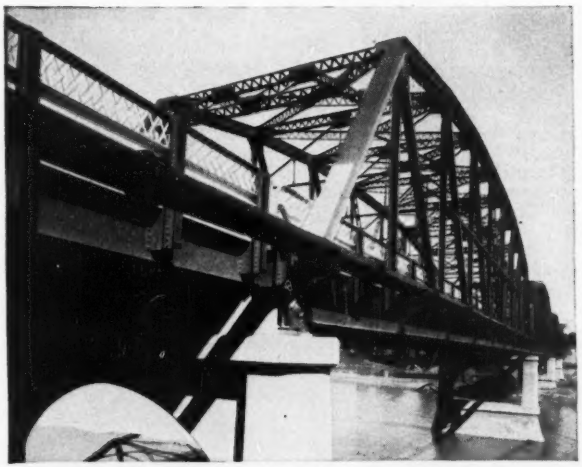

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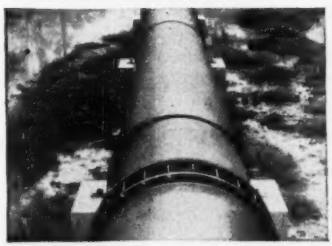

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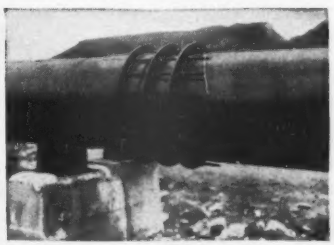

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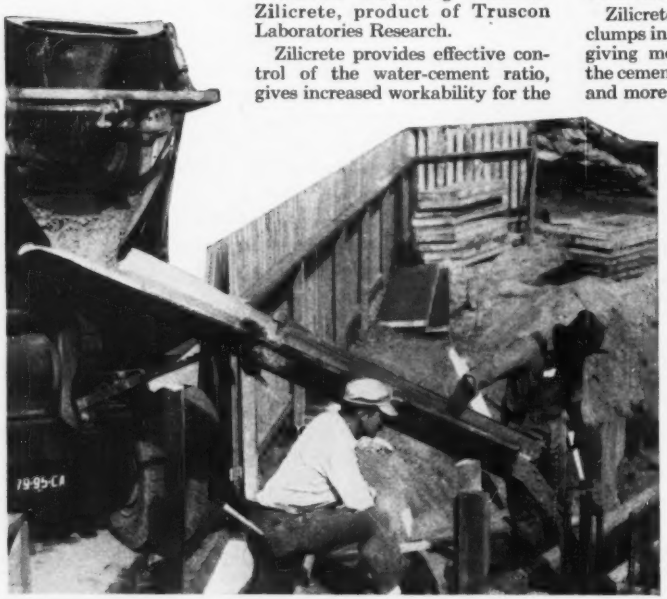

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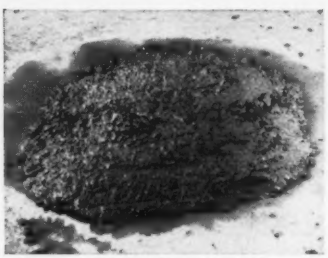

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A $40-million slum clearance program is projected for Newark, N.J.

A slum clearance and redevelopment program to cost $40 million was approved by the Newark, N. J., Housing Authority on Jan. 19, and at the same time it was announced that tentative approval of the project by federal agencies had been received.

The largest project of its kind yet undertaken in New Jersey, the program involves demolition of 469 old buildings and provides for the construction by the authority of a series of elevator-equipped, low-rent apartment houses at a cost of $24 million. Two other projects in the same neighborhood are to be carried out by private builders at a cost of about $16 million.

• **Central location**—The site of the improvement is in the downtown section of the city of 437,857 population. It covers an area of 46 acres north of the Broad Street station of the Lackawanna Railroad. It is planned to acquire the site by negotiation or condemnation.

Tentative plans call for accommodations for 2,082 families in the low-rent project, at an average rent of $35 per apartment monthly; and for 1,030 families in the privately-owned structures at $24 per room monthly, both rental figures to include public utilities.

• **Appropriate landscaping**—Not more than 20 percent of the land will be occupied by the 26 apartment houses from seven to 16 stories in height. The rest of the area will be landscaped.

As to relocation of the 1,362 families now living in the structures to be replaced, the authority hopes to accommodate those eligible for low-rent housing in two other Newark projects now nearing completion.

Application is to be filed at once for a $61,000 planning loan from the Division of Slum Clearance and Urban Redevelopment of the Housing and Home Finance Agency. William E. Lehman will prepare the architectural plans.

It is estimated by Louis Danzig, executive director of the authority, that the city's annual tax income from the completed project will more than treble the current tax income of $176,433 from the properties now on the site to be improved.

GEO. W. SIMONS, JR.
Planning Consultant

Master plan for Tampa offered to city board

A master blueprint for the future growth of Tampa, Fla., port city of 125,000 population has been unveiled before the city board of representatives by George W. Simons Jr., planning consultant of Jacksonville.

Simons listed these 7 projects which he said would enhance the city's growth:

1. Consideration should be given to acquiring, through purchase or condemnation, a large downtown tract on the Hillsborough River now owned by the Atlantic Coast Line Railroad and used for a marshaling yard. This property could be used for an off-street parking area to accommodate some 1500 to 2000 autos daily.

2. The major street framework and the plan of limited access highways proposed by the State Road Department should be adhered to in principle as guides for the future.

3. An overpass between Adamo Dr. on the east and Cass St. on the west should be provided and the possibility of an additional bridge across the Hillsborough River at the foot of Harrison St. be investigated. Also a new bridge should be erected in the vicinity of Krause St. on the east side of Lee St.

4. Efforts should be continued to extend the city limits through annexation of heavily-populated suburbs.

5. The redevelopment and slum clearance program now being initiated in the "scrub" should be extended to other slums, including those in Dobyville and Ybor City. (ENR Jan. 17, page 61)

6. Rail, highway, water and air facilities should be unified and the Polk St. line finally eliminated. Freight facilities should be established east of the city in order to concentrate industry in the Southeast quadrant. The present rail passenger terminal should be enlarged to include a bus terminal.

7. An enabling act authorizing creation of an official planning board should be drawn and presented to the 1953 legislature.

Bismarck plans future as new oil capital

Bismarck, the capital of North Dakota, has aspirations to be the capital of an oil empire including large parts of North and South Dakota and Montana.

To put these aspirations into practical form, its city planning commission has started preparation of a master plan for the city's future expansion. Draftsmen already are at work on a land use map.

Although the four wells which have struck oil are much closer to two other North Dakota cities—Williston and Minot—Bismarck (population 18,640) is the headquarters for more oil companies and lease brokers than either of those cities.

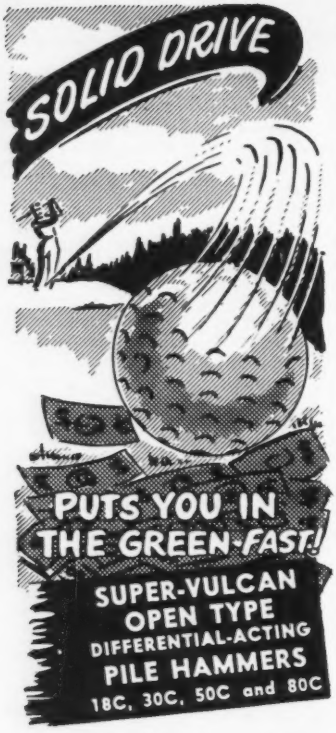
But there was a lot of business activity in Bismarck even before oil was found in North Dakota. The city has issued building permits for 946 new homes since the end of World War II. Prosperity is due to good farm crops and prices and the promise of Missouri River development following the construction of Garrison Dam.

Recently Main Avenue was widened and repaved and a modern street lighting system was installed.

It is estimated that this year's building program will hit $5,000,000.

• **Public works**—Figures from City Auditor Myron Atkinson graphically illustrate what he means when he says the city has been "bursting at the seams." To keep up with the construction of new houses and to improve service to the older areas it has installed many improvements since July 1, 1946, including:

78,652 ft of water mains
36,041 ft of sanitary sewers
36,019 ft of storm water sewers



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Canada determined to proceed with seaway construction

Private contractors will receive the greater part of the construction work on the St. Lawrence Seaway, Lionel Chevrier, Canadian minister of transport, told the 34th annual meeting of the Canadian Construction Association at Toronto Jan. 21. Mr. Chevrier said that the Seaway Project is an urgent must. "We in Canada are determined to have it at the earliest possible date, determined to override the powerful minority interests that have denied it to us these 20 years."

Close to a thousand representatives of the Canadian construction industry registered. Discussed were: steel restrictions, double workmen's compensation assessments, firm prices, backlog of highway construction, payment by results to construction workers, civil defense, approved bidding practices, apprenticeship and immigration.

Dealing with the St. Lawrence Seaway, Mr. Chevrier outlined the development to date, gave reasons why Canada at the last session of Parliament passed seaway authority legislation setting up an organization to build and operate seaway work which had to be done, and expressed hope that the project would still be a joint undertaking by Canada and the U. S.

• **Joint enterprise urged**—Logical action would be a joint enterprise undertaken by Canada and United States, as contemplated in the 1941 agreement, Chevrier, said, however, continued delay in securing approval of the agreement is forcing Canada to proceed with an All-Canadian seaway. . . . The President of the United States, following an interview with the prime minister of Canada recently, has undertaken to give this Canadian project his full support, should Congress fail to take early and favorable action on the 1941 agreement.

He said it would cost Canada about $250 million to build the seaway, with the Ontario provincial government paying for power development on the Canadian side. Large as expenditure is, it is well within Canadian resources, Chevrier said. Canada has already spent over $300 million in providing a ship channel below Montreal, 14-ft canals into Lake Ontario, the Welland Ship Canal, and a lock at Sault Ste Marie.

The average annual steel requirements for an All-Canadian Seaway would be little more than two percent of present total annual consumption, and average annual cement requirements about four percent, spread over five or six years. About 9,500 men would be employed.

• **New president**—Percy G. Wilmut, secretary-treasurer of E. G. M. Cape & Co., Montreal, was elected president of the association on Jan. 23.

Robert Drummond, retiring association president, forecast that 1952 will be the biggest year for the Canadian construction industry; the defense construction will reach its peak in the fall, and that resources development and industry will continue high.

Over $250 million will have been awarded in defense construction contracts by March 31, the end of the fiscal year, said R. G. Johnson, president of the government's Defense Construction (1951) Limited. He forecast that about $200 million will be spent this year by his organization. He urged contractors to combine in small groups when bidding on defense projects, in view of continuing tight material supply for other types of construction.

A. I. C. E. elects officers

The American Institute of Consulting Engineers has announced its new officers for the current year. President is Carroll A. Farwell of Fay, Spofford & Thorndike, Boston; vice-president, George H. Richardson, Pittsburgh;

(Continued on next page)

secretary, Clinton D. Hanover, Jr., of Hardesty & Hanover, New York; and treasurer, George C. Diehl, New York.

The executive committee will consist of Mr. Farwell, E. P. Goodrich, the retiring president, and William H. Mueser of Moran, Proctor, Mueser & Rutledge of New York.

Three new directors were also elected: Richard E. Dougherty of Seelye, Stevenson, Value & Knecht, New York; Charles E. DeLeuw, of DeLeuw; Cather & Co., of Chicago; and John P. Hubbell of Singmaster & Breyer of New York.

Progress in highway research reviewed at board meeting

Increasing interest and participation in the ever-widening field of highway research was evident at the recent 31st annual meeting of the Highway Research Board in Washington. More than 1,250 registered, breaking all records for board meetings.

For the first time in history, the George S. Bartlett Award was conferred individually on two men for their outstanding contributions to highway progress. One award was made posthumously to Roy W. Crum, who died last May after 23 years as director of the Highway Research Board. The other Bartlett Award was conferred on C. S. Mullen, who has served continuously as chief engineer of the Virginia Department of Highways since the post was created in 1929.

Other honors were paid to the memory of Roy W. Crum. The board dedicated the meeting to its late director and, in addition, conferred upon him its Distinguished Service Award.

• **Best paper**—For the best highway research paper published by it during the last year, the board presented its annual award to co-authors Thomas J. Carmichael, administrative engineer of the General Motors Proving Ground, Detroit, and Charles E. Haley, Phoenix, Ariz., project engineer of the Committee on Vehicle Characteristics, Highway Research Board. Their paper was a study of the statistical measurement of relationships between vehicle, roadway, and traffic conditions.

Research board chairman Ralph A. Moyer, of the Institute of Transportation and Traffic Engineering at the University of California, keynoted the meeting in his annual address. He stressed the broadening scope of highway research and the complexity of the problems involved in the critical

(Continued on next page)

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Meetings . . .

fields of finance, taxation and administration. Paying tribute to the advances in highway technology, he said highway engineers must lend their talents to study these problems.

• **Active program**—The 29 sessions, and 150 papers at the meeting attested to the broad range and activity of highway research. More than 200 authors and speakers took part in meetings on economics, finance and administration; traffic and operations; design; construction; maintenance and materials; soils; bridges, and night visibility.

One anticipated highlight of the annual meeting, a report on the famous road test in Maryland (Road Test One-Md.) had to be postponed because the committee in charge of the project had not come to agreement on the findings. But Project Chairman Fred Burggraf, director of the Highway Research Board, and his aides, showed an instructive moving picture on the test project.

CALENDAR

California Conference on Street and Highway Problems, University of California, Los Angeles, Feb. 6-8.

National Council of Private Motor Truck Owners, convention, Hotel Statler, Washington, D. C., Feb. 7-8.

National Sand and Gravel Association, and National Ready Mixed Concrete Association, convention and exposition, Conrad Hilton Hotel, Chicago, Ill., week of Feb. 11.

National Council for Stream Improvement, Waldorf-Astoria Hotel, N. Y. City, Feb. 18-21.

Illinois annual conference on Highway Engineering, Urbana, Feb. 19-21.

N. Y. State County Highway Superintendents Association, DeWitt Clinton Hotel, Albany, Feb. 20-22.

National Engineering Employees Conference, Hotel Morrison, Chicago, Ill., Feb. 22-24.

Mason Contractors' Association, convention, Palmer House, Chicago, Ill., Feb. 24-27.

Associated General Contractors of America, Statler Hotel, Detroit, Feb. 25-28.

Materials Handling Conference, Purdue University, LaFayette, Ind., Feb. 25-26.

American Concrete Institute, Netherland Plaza Hotel, Cincinnati, Ohio, Feb. 26-28.

American Concrete Pipe Association, annual convention, Drake Hotel, Chicago, Ill., Feb. 28-March 1.

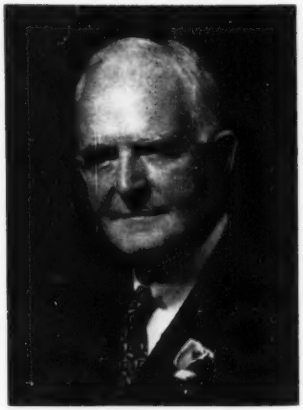
American Society for Testing Materials, spring meeting, Hotel Statler, Cleveland, Ohio, March 3-7.

American Society of Civil Engineers, winter meeting, St. Charles Hotel, New Orleans, La., March 3-7.

American Railway Engineering Association, Palmer House, Chicago, March 11-13.

New Jersey Sewage and Industrial Wastes Association, Traymore Hotel, Atlantic City, N. J., March 12-14.

American Power Conference, Sherman Hotel, Chicago, March 26-28.



J. P. H. Perry to expedite U. S. airbase construction

John P. H. Perry, formerly vice-president of the Turner Construction Co., New York, has been appointed deputy for installations in the office of Assistant Secretary Edwin V. Huggins of the Air Force. In his new position he will be responsible for expediting the U. S. airbase program both at home and overseas.

Mr. Perry, a 1903 graduate of Harvard, was associated with the Turner organization from 1906 until his retirement about two years ago. For the past year he has been head of the construction division of the Munitions Board. Active in both professional and contracting affairs throughout his long career, he has been president of the New York Metropolitan Section of the American Society of Civil Engineers and of United Engineering Trustees.

Commissioner appointed

Samuel S. Baxter has been appointed Commissioner of Water for Philadelphia, Pa. He has been the chief engineer and acting chief of the Bureau of Engineering, Surveys and Zoning. Mr. Baxter was educated at Drexel Institute of Technology and the University of Pennsylvania. During World War II he worked on Army construction at the Northeast Philadelphia Airport, and later supervised design and construction of Oak Ridge, Tenn. Since 1946 he has been in charge of engineering in municipal work including construction of the city's $50 million sewage disposal system, now half completed.

Two other engineers have been named to key positions in the new city administration. Paul MacMurray former chief of the Bureau of Highways is now Streets Commissioner. Charles H. Frazier is the Procurement Commissioner. MacMurray is a civil engineer graduate of Lafayette and Frazier of Harvard Graduate School of Engineering.

Col. Walter C. Smith has been appointed District 6 engineer for the state road commission of West Virginia at Moundsville.

Fred L. Goldsby, civil engineer, has succeeded **W. D. Robinson**, retired, in the Chicago Bridge and Iron Co.'s export department at 165 Broadway, New York City; and **Marvin G. Mitchell**, also a civil engineer, has been appointed manager of the company's sales office at Atlanta, Ga.

Axel O. Olson, formerly chief engineer of the Public Utilities Commission, City and County of San Francisco, will be western manager of DeLeuw, Cather & Co., at 79 McAllister St., San Francisco 2.

Robert I. Blake, equipment and building engineer for the Pacific Telephone and Telegraph Co., is retiring after 44 years. He planned the construction of 250 new telephone buildings.

Fred V. Munro is the new field engineer in charge of explorations of all of the Missouri basin area in the Great Falls, Mont., district, Bureau of Reclamation.

Donald M. McNeil, traffic engineer of Pittsburgh, Pa., has resigned that job and also as consultant to the Pittsburgh Public Parking Authority.

Nicholas V. Feodoroff, associate professor of civil engineering at Manhattan College, has been accepted as a Fellow in the New York Academy of Sciences in recognition of his outstanding scientific achievements.

A. D. McWhorter, who retired two years ago as chief engineer of the Memphis Street Railway Co., has been appointed consultant to the Defense Transport Administration. He will work with a committee on removing street railway tracks in cities that have converted to coaches and buses.

Lt. Col. Harry F. Hansen has been made assistant engineer commissioner of the District of Columbia.

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Model No. 1000-L BONDACTOR operates with a 210 CFM or larger air compressor.
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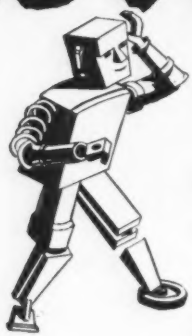

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Here, too, your scrap contribution is of vital importance... enabling us to serve you better... helping to provide you with continued, uninterrupted supply.

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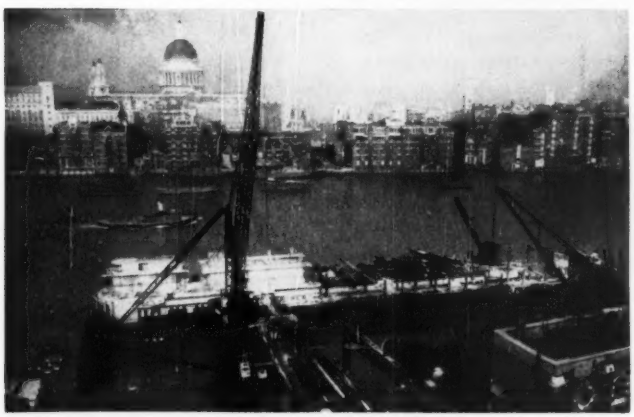
Construction news in pictures from around the world

FRANCE

French workers level the railroad bed in one of the installations under construction at Sollac for Societe Lorraine de Laminage Continu, France's great steel organization which is the result of a 9-company merger. More than $173 million of Marshall Plan funds is going into the construction of a hot strip mill, cold strip rolling mill, and tin plate plant in the Lorraine basin. Regarding this plant Foreign Minister Robert Schuman says, "We intend to put this plant at the disposal of Europe as a whole."

RUSSIA

Heavy earthmoving operations for Kuibyshev Dam on the Volga River in central Russia make use of the U. S.-style line of big trucks and power shovels. Dam will be one of two on the Volga (The other is to be built at Stalingrad) and, according to Soviet information, when completed the dam will produce more power than Grand Coulee—(Sovfoto).

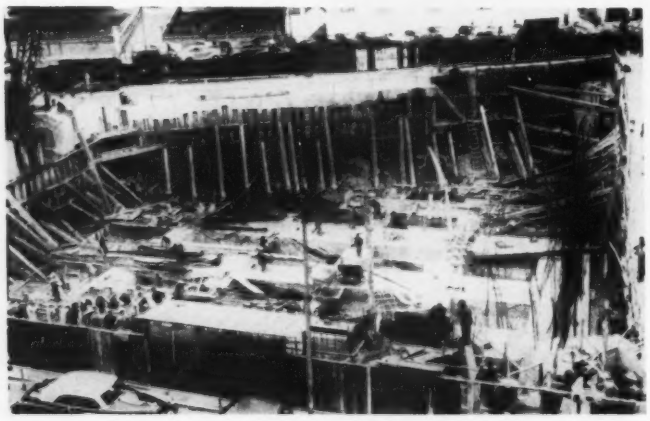


LONDON

Progress is shown on the new London Power oil-burning station at Bankside on the Thames. It will be 600 ft long and 100 ft high, with two 300-ft chimneys. It was designed by Sir Giles Gilbert Scott. There was public opposition to the building on the ground that it would spoil the view of St. Pauls Cathedral and other famous buildings across the river.

IRAQ

Lacking headwater reservoir sites on its two main rivers—the Tigris and Euphrates—Iraq is utilizing natural depressions in the river valleys to store its flood waters. The largest job, now nearing completion, involves Lake Habbaniyah, 50 miles west of Baghdad. This depression will hold 1,400,000 acre-ft, and floodwaters will be diverted into it through the Warrar inlet channel across which the multi-gated dam shown here is being built. Outlet works, with regulating gates are already completed. (ENR Nov. 1, page 66.) The water will be used for irrigating large new areas, and the flood storage will save Baghdad from periodic and costly inundations. The work is being done by British firms—Coode, Vaughan-Lee Frank & Gwyther, consulting engineers and Balfour, Beatty & Co., contractors.

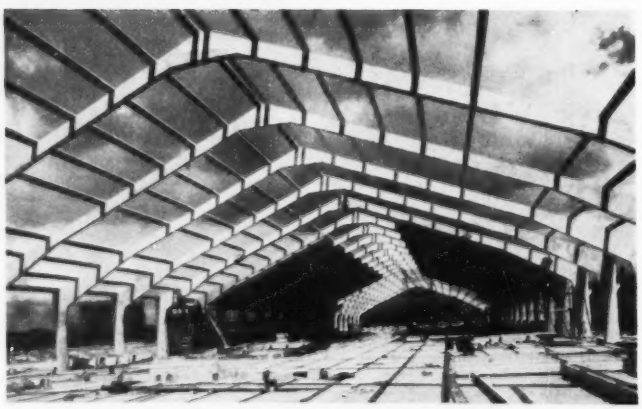


HONG KONG

George Winnipeg & Co. Ltd. of London is building a 17-story building in Hong Kong for the Bank of China. It will be 251 ft high. As it was found that there was no rock for a depth of 100 ft, erection is going on supported by 351 piles driven to depths of from 15 to 25 ft by the Franki Piling Co. The building is designed by Palmer & Turner, Hong Kong. It will have a dressed granite exterior.

ENGLAND

Structural framework for a new building at the Doulton & Co. Whieldon Works, Stoke-on-Trent, England, consists of precast rigid frames with 85-ft span. Each frame has four sections—two vertical legs and two rafters—with a patented scarfed joint at field splices. Despite the long span, rafters are only 7x18 in. Frames are spaced 15 ft on centers. W. S. Atkins & Partners were the engineers and C. Cornes & Son, the contractors.



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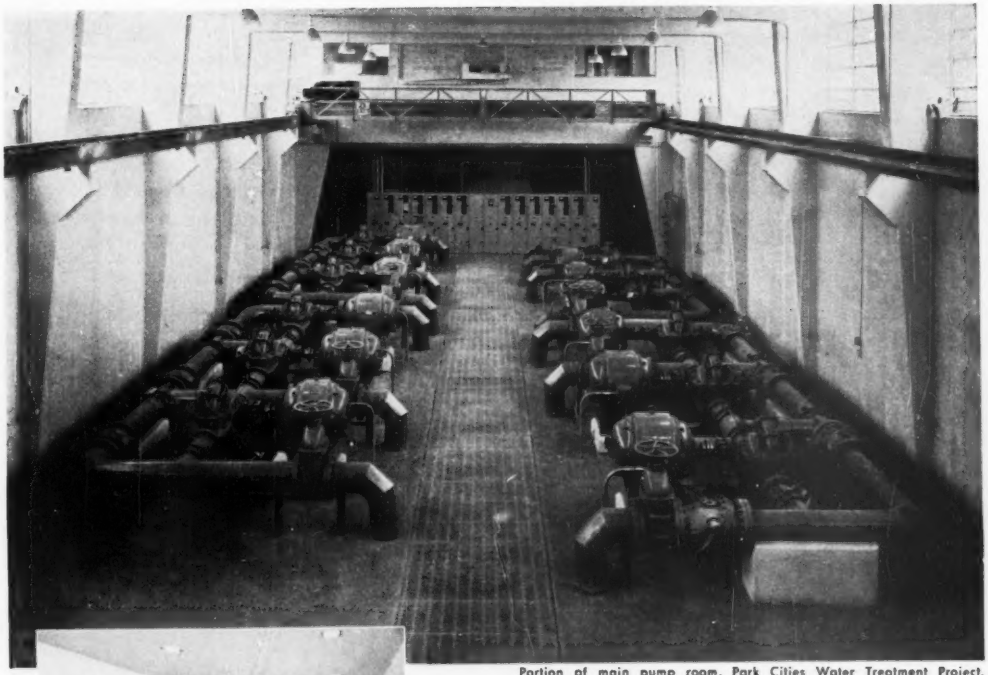

Portion of main pump room, Park Cities Water Treatment Project. Shown are 13 of the 22 Economy Pumps installed on this project.

View in University Park Booster Station, part of the Park Cities project. These Economy Pumps boost the pressure going to the overhead storage tank, located 5 miles from the treatment plant.

in new Park Cities, Texas, Water Treatment Plant

Economical operation over a period of years was a primary requisite of the pumps for Park Cities Water Treatment Project, Dallas. In selecting pumps, Powell & Powell, Consulting Engineers, drew up specifications which took into consideration cost of equipment, efficiency of each unit and efficiency of units operating in series, plus rigid structural requirements and refinements of mechanical detail. Under this very exacting evaluation formula, Economy Pumps, designed especially for water works service, supplied by the Lone Star Pump and Machinery Co., were selected, on the Dallas County project.

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Eight months ahead of schedule! That was the record chalked up on this Oakland outfall sewer line, despite wet heaving ground that required sheeting of trench every inch of the way. An ingenious mobile sheeting jig and fast-driving McKiernan-Terry Pile Hammers solved the problem.

Here's how. The jig held lagging for 20 lin ft of timber sheeting on both sides of the trench at the same time. Sheeting was driven quickly by McKiernan-Terry No. 6.5 Double-Acting Hammers . . . as much as 245 pieces of sheeting daily.

Wherever you need speed and pile-driving power, it will pay you to use dependable McKiernan-Terry equipment. Wide-range line includes 16 sizes of single-acting and double-acting hammers and 2 sizes of double-acting extractors. Write for bulletin.

McKiernan-Terry Pile Hammer punches down timber sheeting for fast sewer job in Oakland, Calif. Ben C. Gerwick Inc. and George C. Pollock Co. were the joint contractors.

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OBITUARIES

Herbert A. Moody, 74, hydraulic engineer of the Western Massachusetts Electric Co., Turners Falls, until his retirement in 1950, died recently at Saco, Me. Educated at Worcester Polytechnic Institute, he joined the company in 1913 and made a major contribution to research on the hydroelectric potential of New England.

Evan Thomas, 81, a civil engineer in Scranton, Pa., for 40 years, died Jan. 9. He spent 16 years as an engineer for the Pennsylvania Highways Department, and 24 years with the Scranton engineering department. He was assistant city engineer for 12 years prior to his retirement in 1938.

Clarence A. Degner, 64, Toledo, Ohio, structural engineer and contractor, died Jan. 10. He was a graduate of Ohio State University and was with Finkbeiner, Pettis and Strout.

Birger Leon, 65, one of Canada's leading architectural engineers and chief of the projects division of the Department of Resources and Development, died in Ottawa, Jan. 6. Until 1932 he was chief engineer with a steel firm in Toronto, was the designer of a number of Toronto buildings.

Harry D. Sues, 74, structural engineer for more than 40 years, died Jan. 6 in Chicago. He had been associated with Prof. George Maney of Northwestern University in designing Mississippi River bridges. He had also been employed by the Board of Education, the Chicago, Milwaukee and St. Paul Railroad, and the American Bridge Co.

G. Douglas Andrews, 59, former chief engineer of the Baltimore County Metropolitan District, died Jan. 9. A graduate of Lafayette College and a combat veteran of World War I, he had headed his own engineering firm in Towson, Md., and Harrisburg, Pa., since his retirement from the County post in 1947. After college, he attended the U.S. Military Academy. He was an officer in the First World War. Then he went with Merritt-Chapman & Scott, and later was named PWA administrator for Pennsylvania. Between 1939 and 1941, he took part in the construction of the Pennsylvania Turnpike. He went to Rio de Janeiro as a consulting engineer for a Brazilian government project. During World War II, he was project manager of the $31,000,000 Jayhawk Ordnance Works built by the Army in Kansas.

Channing Whitman, 47, Boston civil engineer, died Jan. 13, at Massachusetts General Hospital. His home was in Wellesley. From 1943 to 1946, he worked on the Alaska Highway. He then worked in Japan, returning to this country to start construction of the air base in Limestone, Me. Recently he was attached to the United States Naval Ordnance Plant in Sorel, Canada. He was a graduate of Cornell University.

Harry B. Hoshall, 66, associate professor of engineering at the University of Maryland, died Jan. 5 in York, Pa. He was graduated from that university in 1908 and joined the faculty in 1918.

W. L. G. Joerg, 66, chief of the cartographic records branch of the National Archives since 1937, and known for his studies in geography, exploration and surveying, died Jan. 7.

Edward Miley Eustler, 58, city engineer of Whiteville, N. C., died Jan. 13. He had practiced civil engineering there for 23 years and prior to that was at New Bern, N. C.

George Fulton, 51, president of the Fulton Construction Co., Houston, Tex., died there Jan. 11. He was a 1925 graduate of the University of Minnesota and became well known for his work in the heavy construction field. He built terminal facilities at Halifax, N. S., carried out a large mine-stripping project in Quebec, did relocation work for the Canadian Pacific Railway, lock and dam constructions in Mississippi, an oversea highway near Key West, Fla.

Walter P. Hirschberg, 72, an architectural engineer who was an authority on reinforced concrete design, died at Milwaukee, Wis., Jan. 11. He headed the Federal Engineering Corp., specializing in design of industrial buildings.

Harold A. Rands, 80, retired engineer, died Jan. 8 at Portland, Ore. He was a graduate of Cornell University and worked with the U.S. land surveys from 1901 to 1909, when he became assistant construction engineer of the Estacada hydroelectric development of Portland Electric Power Co (now Portland General Electric Co). After acting as field engineer in Alaska for the Hammond Construction Co, he returned to the Pacific Northwest and made hydroelectric power surveys.

A survey of the ground-water situation in the United States

HERE are the results of a thorough survey, bringing together and analyzing all the available information on the development and use of ground water throughout the United States. For hydrologists, engineers, and others concerned with the problems of ground-water supply, the book provides an authoritative discussion of the natural and legal factors connected with ground-water development and use, with descriptions of the techniques and systems used in a variety of projects.

THE CONSERVATION OF GROUND WATER

By Harold E. Thomas

U. S. Geological Survey

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UNIT PRICES BID BY CONTRACTORS

Eklutna Tunnel, Alaska

Contractors bid two ways on the 4-mile Eklutna Diversion Tunnel at Eklutna, Alaska, let September 11 by the U. S. Bureau of Reclamation, L. N. McClellan, chief engineer. The low bid on schedule one, for a tunnel with intake at elevation 794, was $17,348,865 as against the engineer's estimate of $18,175,568. The low bid on schedule two, for a tunnel with intake at elevation 842.68, was $16,391,192 compared with the engineer's estimate of $15,687,384.

Contract was awarded on schedule one to the low of four bidders, Palmers Constructors, a joint enterprise consisting of Morrison-Knudson Co., Inc., Peter Kiewit Sons' Co., and Cokes Construction Co., also contractor on the $21 million Eklutna tunnel work on which unit prices were reported in ENR August 16, 1951.

The work is situated about 30 miles northeast of Anchorage, Alaska. Part of the Eklutna Project, the job includes the intake structure, precast-concrete pipe conduit, steel penstocks, gate shaft, surge tank, and alterations to the existing Eklutna Dam.

The Government supplies these materials: items for the gate shaft, such as bulkhead gate with hoist, stems, support beams, ladders, frames, etc.; items for the surge tank; orifice metalwork between surge tank and tunnel; oil tanks, pumps, and all pipe, fittings, valves, and gages for piping between oil tanks; oil pumps and hoist cylinders; rubber water stops; lubricating oil for servicing equipment to be installed; and steel penstock. Contractors will furnish all other materials.

Work is to begin 30 days after receipt of notice to proceed. Contractors have been given 1,050 calendar days to complete the tunnel. Liquidated damages will amount to $500 per day for each day's delay.

Minimum wage rates range from $2.67 per hour for common labor to $3.02-$3.80 per hour for skilled labor.

Bids on Schedule I include:

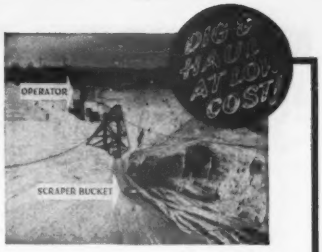
1C Palmer Constructors, Omaha, Neb.	$17,348,865.00
2 Grafe-Callahan Constr. Co., D. G. Gordon, Rhoades-Shofner Constr. Co., Los Angeles	17,776,596.50
4 Wm. A. Smith Contracting Co. of Missouri, Kansas City, Kan., Brown & Root, Inc., Houston, Tex.	22,586,725.00

Bids: 9-11-51 Items	Unit	Quantity	Unit prices 1 C	2
Exc, open cut, for inlet first 205,000 cy	cy	205,000	$3.00	$2.20
over 205,000 cy	cy	205,000	0.60	0.80
C & i intake trashrack sect	ls	.....	150,000	180,000
transition sect	ls	.....	37,000	71,500
bulkhead sect	ls	.....	27,000	50,000
F&i 9-ft dia precast cond	lf	225	1,500	1,092
Constr tun between sta 20+00 & 27+11.50	lf	711.5	1,500	1,092
Exc, open cut for gate sh	cy	21,000	5.00	7.20
Exc for gate shaft	cy	920	400.00	325.00
Exc for surge tank	cy	5,700	120.00	75.00
Exc in tunnel	cy	82,500	80.00	86.85
Exc in incl penst tun	cy	3,600	250.00	180.00
Exc for tunnel enlarg	cy	200	87.50	200.00
Bkfl about intake struct	cy	1,000	12.00	62.50
F&i perm stl tun supports	lb	1,415,000	0.25	0.27
F&e perm timb in tun	Mfbm	615	400.00	465.00
F&i tun roof suppt bolts	lf	11,800	4.00	9.00
Drill feeler or pilot holes ahead of tun exc	lf	10,000	10.00	8.00
Drill grout holes	lf	2,500	10.00	5.50
F&p grt pipes & conn	lb	7,500	1.00	2.10
Pressure grouting	cf	25,000	6.00	15.00
Pump drnge water from tun at any rate	Mil gal	100	5,000	3,000
at rate of 0-2mil gal per 24 hrs	Mil gal	600	100.00	385.00
at rate of 2mil & 1gal-4mil gal per 24 hrs	Mil gal	200	100.00	550.00
at rate of over 4mil gal per 24 hrs	Mil gal	100	100.00	1,100.00
Conc in gate shaft	cy	390	100.00	170.00
in surge tank	cy	1,235	100.00	170.00
in tun lining	cy	25,610	75.00	85.00
around penstock	cy	3,450	75.00	85.00
F&h cement	bbl	52,280	12.00	12.50
F&p reinf bars	lb	5,551,000	0.25	0.20
Install penstock	lb	1,281,000	0.25	0.30
frames & guides for blkhead & fixed-wheel gates & hoist suppt beams	lb	24,000	0.25	0.32
fixed-whl & blkhd gate	lb	41,000	0.25	0.32
fixed-whl & blkhd gate hsts	lb	21,000	0.25	0.32
control appar & pip for blkhead & fixed-whl gates	lb	2,250	0.50	0.60
gate shaft & surge tank metal work	lb	14,000	0.50	0.40
F&e str stl in surge tank rf	lb	7,200	0.50	0.51
F&i stl swinging door	sf	20	15.00	50.00
Place rubber water stop	lf	910	5.00	4.40
Exc, strip borrow areas & surf of dam embank	cy	300	4.00	8.35
Earth-fill embank for dam	cy	500	2.00	9.50
Sand & grvl blnkt on rprap	cy	60	5.00	20.00
Riprap	cy	2,000	10.00	8.85
Constr anchor & extension to exist sh a t l piling	ls	.....	12,000	23,600
F&d timber piles	lf	750	5.00	10.85
Moving deck of exist trestle	ls	.....	7,490	19,000

Bids on Schedule II include:

1 Grafe-Callahan Constr. Co., D. G. Gordon Rhoades-Shofner Constr. Co., Los Angeles	$16,391,192
2 Palmer Constructors, Omaha, Neb	16,419,440
4 Wm. A. Smith Contracting Co. of Missouri, K C, Kan., Brown & Root, Inc., Tex	19,438,700

Bids: 9-11-51 Items	Unit	Quantity	Unit prices 1	2
Exc, open cut for inlet chan	cy	122,000	$1.00	$2.00
Exc, open cut for intake struct, inlet cond, tun intake portal & gate shaft	cy	209,000	4.00	5.00
Exc for gate shaft	cy	250	200.00	400.00
for surge tank	cy	5,200	75.00	120.00
in tunnel	cy	84,200	86.85	85.00
in incl penst tun	cy	3,850	180.00	250.00
for tunnel enlarg	cy	200	200.00	80.00
Bkfl over inlet conduit	cy	1,100	2.50	10.00
about intake struct	cy	150	15.00	10.00
F&i perm stl tun suppts	lb	1,479,000	0.27	0.25
F&e perm timb in tun	Mfbm	680	465.00	400.00
F&i tun roof suppt bolts	lf	9,300	9.00	4.00
Drill feeler or pilot holes ahead of tun exc	lf	10,000	8.00	10.00
Drill grout holes	lf	2,500	5.50	10.00
F&p grt pipes & conn	lb	7,500	2.10	1.00
Pressure grouting	cf	25,000	15.00	6.00
Pump first 100mil gal of drnge water from tun at any rate	Mil gal	100	3,000	5,000
Pump drnge water from tun at rate of 0-2mil gal per 24 hours	Mil gal	600	385.00	100.00
at rate of 2mil & 1 gal-4mil gal per 24 hours	Mil gal	200	550.00	100.00
at rate of over 4mil gal per 24 hours	Mil gal	100	1,100	100.00
Conc in intake struct & inlet conduit	cy	230	170.00	250.00
in gate shaft	cy	130	170.00	100.00
in surge tank	cy	1,150	170.00	100.00
in tunnel lining	cy	25,370	85.00	75.00
around penstock	cy	3,610	85.00	75.00
F&h cement	bbl	52,320	12.50	12.00
F&p reinforcement bars	lb	4,990,000	0.20	0.25
Install stl penstock	lb	1,460,000	0.30	0.25
F&e timb in trshrck sect	Mfbm	5	700.00	500.00
Install frames & guides for blkhd & fixed-whl gates & hoist suppt beams	lb	24,000	0.32	0.25
fixed-wheel & blkhd gates	lb	41,000	0.32	0.25
fixed-whl & blkhd gate hoists	lb	21,000	0.32	0.25
control appar & pipr blkhd & fixed-whl gate	lb	2,250	0.60	0.50
gate shft & wtg tank metwk	lb	14,000	0.40	0.50
F&e str stl in surge tank rf	lb	7,200	0.51	0.50
F&i stl swinging door	sf	20	50.00	15.00
Riprap	cy	7,000	7.50	10.00
Placing rubber water stop	lf	875	4.40	5.00



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NLRB stays out of jurisdictional fight

The National Labor Relations Board has clarified further its decision that, under the Taft-Hartley labor law, it should not intervene in a jurisdictional dispute where an employer and a union have agreed on a method for settling jurisdictional questions.

Several months ago, in a case involving Manhattan Construction Co., NLRB refused to act on this contractors request that it decide against demands of the AFL carpenters that its members, instead of laborers, should strip wooden forms used in pouring concrete.

NLRB's reasoning in that case was this: The contractor and the unions were all parties to the construction industry-building trades agreement to settle disputes through the industry's National Joint Board for Settling Jurisdictional Disputes. Moreover, the carpenters had petitioned the joint board for a decision, which eventually was in their favor.

Under Taft-Hartley, NLRB pointed out, it is supposed to decide a jurisdictional issue only if (within ten days) the parties have not decided it themselves or "agreed upon methods" for reaching a decision. NLRB felt that the standing agreement to use the joint board procedures constituted an "agreed upon method."

By this, NLRB said, Congress intended to encourage unions and employers to settle jurisdictional disputes without government intervention. Therefore, it should stay out of situations where voluntary methods exist.

• **New case**—Now, in another case involving two locals of the same international union, NLRB goes further. It decided that it will not intervene even where the agreed machinery does not settle a jurisdictional dispute because of a contractor's refusal to recognize the voluntary procedure.

This case involves Traylor Brothers, Inc., under contract with F. H. McGraw Co. to supply and deliver stone for construction of the Atomic Energy Commission's new gaseous diffusion plant at Paducah, Ky. Traylor Brothers contracted with Basse & Burde of Olmstead, Ill., general truckers, to deliver the stone. Basse & Burde had a bargaining contract with Local 934 of the AFL Teamsters union at Harrisburg, Ill., and it used members of this local for the work at Paducah. Teamster Local 236 at Paducah, with 150 members unemployed, protested that its members should do this work under an agreement of the Teamsters international union that Local 236 would have jurisdiction over all teamster work on the AEC job at Paducah.

Basse & Burde's agreement with Local 934 provided that any jurisdictional dispute within the teamsters would be decided by the business agents of the locals involved. In this instance, they decided that the Paducah work belonged to Local 236. But the trucking firm refused to comply because it would mean laying off its own drivers.

NLRB refused to act on a petition of Traylor Brothers to settle the dispute under Taft-Hartley. NLRB held it had to recognize the agreed-upon method for settling such disputes, even though the trucking firm refused to observe it.

To do otherwise, NLRB said, "contrary to the purpose of Taft-Hartley to encourage voluntary settlements.

Labor briefs . . .

• **CIO-AFL accord**—Through an accord reached at a luncheon meeting, New York City CIO and AFL heads agreed to set up a 10-man arbitration board to settle jurisdictional disputes between unions of the two organizations.

• **End Scranton strike**—A weeklong work stoppage by journeymen plumbers and steamfitters at Scranton was ended after a union-employer conference at which employers agreed to abide by a CISC award of 10 cents an hour raise to the journeymen.

• **End Denver A-plant strike**—Construction workers at the AEC's Rocky Flats project, near Denver, ended an 8-day walkout with agreement that the work would proceed on a "union shop basis" with AFL unions supplying workmen to contractors. Employment of non-union men caused the walkout.

• **Probe building wages**—WSB investigators have started a probe of wages paid building tradesmen on a $5 million Alverno College construction job at Milwaukee, after local employers had complained that a Chicago contractor on the job (James McHugh Construction Co., Inc.) was paying wages that were "upsetting" local wage patterns. The alleged overpayments included pay for travel.

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A-971

Army switches builders on plush base

Contractors were shuffled by the Army Corps of Engineers last week in a decision on who will build a de luxe, $6.6 million housing project at Camp Ritchie, Maryland, in conjunction with the government's huge underground communications center—sometimes dubbed "the second Pentagon".

Behind the shuffle were such diverse factors as post-war planning, Congressional curiosity, and a contractor's sit-down strike.

Plans for a second Pentagon—an underground, command post for the Department of Defense, to be used in case above-ground facilities were destroyed by enemy air attack—were formulated just after World War II.

• **Change in plans**—Later, the Joint Chiefs of Staff decided the military would have to take its chances with the rest of the Washington area, cut back the project to a communications center underground. To do this job, the government awarded a $7 million contract to S. A. Healy Co. last August. That part of the project was completed.

Then John McShain Co. came into the picture. McShain held an $11.8 million contract for utilities, services and appurtenant structures at Camp Ritchie, plus rehabilitation of existing structures. When bids were taken then for housing, bachelor officers quarters, and recreational facilities, McShain bid $6.6 million (on the basis of doing the job in conjunction with the other $11.8 million work) and received the contract. John A. Johnson Co. was second low bidder. This was October 30, 1951.

A week later, after Congressmen started to show interest in the de luxe project, the Pentagon announced that "in compliance with the expressed desires of Congress, it has reviewed requirements at Fort Ritchie, Maryland, and has determined that certain facilities scheduled for construction will not be constructed at this time."

• **What it meant**—The Congressional fear that the stand-by camp would become a weekend resort for Army officers turned up quickly in the dollar columns. The Army notified McShain that about $12 million in construction would be cut out (the rehabilitation work) but that the housing could go ahead.

The company's reply was in effect a "No, thank you." Its position was obviously tied to the fact that the $6.6 million bid on the housing job would be feasible only because the bigger contract was on hand, for the rehabilitation.

The Army, contending that there was nothing in McShain's contract that would permit him to cancel, told him he would have to do the job.

• **Sit and wait**—The McShain firm didn't go through with the contract on that basis, decided to let the whole project sit. McShain himself went off to South America to take a look at some projects down there.

Then, within the last two weeks, conferences were called at Engineers' headquarters. McShain was notified the contract had been cancelled.

There was a report that Johnson had been awarded the contract.

• **What's next?**—McShain is now reportedly in a huddle with his attorneys —and the Army Engineers are also studying the legal aspects. One possibility: The Army may sue McShain for non-performance of contract, try to secure as damages the difference between McShain's low bid and the second low.

Highway money fight looms in Congress

Congressional committee rooms are going to see plenty of unusually heated debate before two widely divergent highway appropriation bills that have been introduced, are finally reconciled.

The House Committee on Public Works has before it a bill from Rep. Charles A. Buckley recommending $529 million—close to what President Truman recommended in his budget.

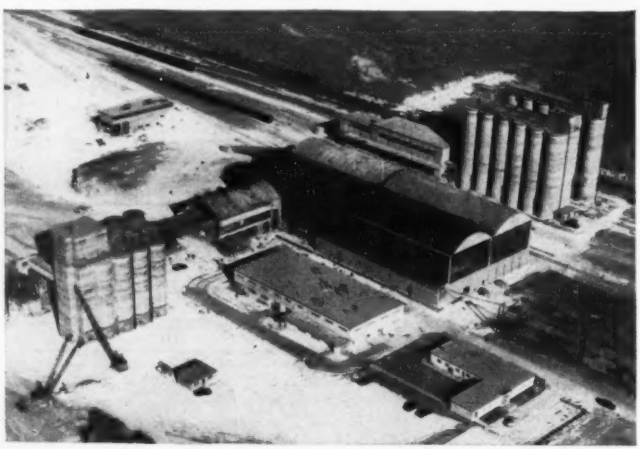
The Senate Committee on Public Works has before it a bill from Senator Dennis Chavez recommending $937 million—close to the formal recommendations of the American Association of State Highway Officials.

Hearings are scheduled to begin next week. Both sides are preparing to marshal expert testimony.

• **New Jersey funds**—In the record-breaking $198 million budget Gov. Alfred E. Driscoll placed before the New Jersey legislature, is a proposal that the budget can be balanced without additional taxes if some $21.5 million in highway funds is diverted to general purposes. In spite of the diversion of these funds, the governor recommended appropriation of $19.5 million for new highway construction in fiscal 1952. With federal aid, this would make over $37 million available for highways.

Nebraska's road construction expenditure this year will come to about $9 million. Planned 1952 construction compares with $13 million in 1951 and $18 million in 1950.

Nevada's State Highway Board has announced a record high 1952 budget



BEGAN SHIPPING LAST WEEK—Lone Star Cement's new mill at Maryneal (Nolan County) Texas, began shipping cement this week. Located in the heart of fast-growing West Texas, it has a daily capacity of 4,200 bbl and is the third Lone Star Cement mill in that state. The others are at Dallas and Houston.

proposing expenditures of $8.5 million, a slight increase over last year. . . . The Wisconsin State Highway Commission hopes to take bids on the first contract for the Milwaukee expressways construction on Feb. 19. . . . The Colorado legislature has approved a study of the Moffat railroad tunnel by the State Highway Department, to determine feasibility of making it available for automotive traffic (ENR Jan. 24, p. 28). . . . In New York Governor Thomas E. Dewey's budget will make $155 million available for highway construction—twice the amount provided for highways in last year's budget proposal. . . . In Georgia Gov. Herman Talmadge has backed down on a proposal to make toll roads of the state's main highways. He still wants one toll road, however—a superhighway reaching from Cartersville, Ga., to the Tennessee line at Chattanooga. A four-lane highway already connects Cartersville and Atlanta. . . . A report recommending that the city approve plans of the Port of New York Authority for construction of the proposed $85 million third tube for the Lincoln Tunnel awaits decision by the Board of Estimate.

NPA turns down 73% of late applications

The National Production Authority turned down 372—or 73%—of 507 late applications for approval to build fire houses, office buildings and other projects of a commercial, religious or community nature in the first quarter of 1952.

Only 107 of the late applicants received allotments of steel and copper for first quarter construction. Twenty-eight other applicants were given the green light because they already had the materials in their possession, or in some of the cases, required only small amounts.

Overall total of first quarter construction applications handled by NPA is now 2,559. Of this number, the National Production Authority denied 1,982—or 77%—of the applications.

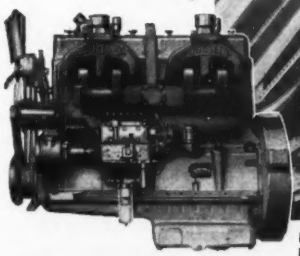
Agency officials said materials were so scarce that NPA was forced to deny all applications except in cases where construction was at least 20% complete—or where a facility was needed to replace another which had been destroyed by fire or other disaster.

Business briefs . . .

• **Cost index rises**—The American Appraisal Company Construction Cost Index rose 22 points, or 4% during 1951 to reach an all-time high of 539. The index rose one point from November to December. Index is based on 100 representing 1913 costs.

Quarries to Dams-----

P&H Model 955A Shovel in quarry of Massachusetts Broken Stone Co., Weston, Mass., has a 6-WAKD WAUKESHA DIESEL as does the P&H 995A Crane pouring cement on Mansfield Hollow Dam, Willimantic, Conn. D.V. Frione & Co., New Haven, own the crane.



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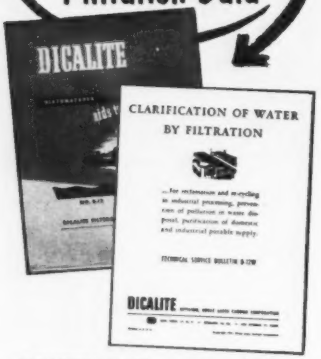

BULLETIN B-12 on general filtration principles; BULLETIN B-12-W details information on filtering potable and waste water.

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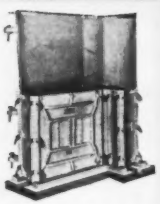

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When placing concrete, use this nationwide Form Rental and Engineering Service to increase profits, reduce costs.

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metal forms for concrete construction

Triborough sale shows market strength

Confirming the strength of the bond market shown a week ago on a huge issue of housing bonds, (ENR Jan. 24, p. 72) New York's Triborough Bridge & Tunnel Authority last week had no trouble placing a $215 million refunding bond issue. The transaction will have the effect of releasing substantial funds for new construction work.

The bond issue—sale of which will net the authority approximately $211.9 million—is actually the consolidated debt of the agency. Proceeds will be used to retire $211.6 million of outstanding debt and set up a reserve fund. The issue was reported to be the biggest bond flotation ever made in New York.

Interest rates ranged from 1⅞ to 2¼%, and the bonds were priced to return tax-free yields ranging from 1.45 to 2.20%.

The bonds themselves are actually a new form for Triborough, being secured by the pooled revenues of the five bridges, two tunnels and other toll facilities operated by the agency. Previous bond issues—because of the peculiar history of the agency—were tied closely to revenues of particular projects for which the bonds were floated, and excess revenues could not be applied to other work.

The peculiar conditions include the fact that the authority took over independent authorities which had started work on such facilities as the Queens-Midtown Tunnel, the Brooklyn-Battery Tunnel, and had issued bonds to finance these jobs.

Although principal purpose of the new issue is to clear up and regularize this scattered debt pattern, it will have the effect of making more money available for new construction:

Surplus tolls available from some of the authority's extremely profitable enterprises will thus be available for other purposes; the authority's improved debt position should make lower interest rates available.

Among the new construction programs in prospect are: $80 million for highway projects; $20 million for the long-planned convention hall and parking garage (to eventually replace Madison Square Garden) at Columbus Circle in Manhattan.

States plan investment in institutional buildings

Plans for heavy investment in state institutional buildings were apparent last week, as state legislatures began to receive budget requests from their chief executives.

In ten states alone (California, Arizona, New Jersey, New York, Pennsylvania, Kentucky, South Carolina, Texas, Virginia and Minnesota) governors had already asked for funds totalling more than $267 million to finance such construction work. Other states are sure to follow.

Means of financing this work vary almost state to state. California expected to handle its $57 million program through appropriations; New Jersey would issue $25 million in state-backed bonds; Pennsylvania already has authorized its General State Authority to increase its borrowing capacity by $60 million; in Texas, the State Hospital Board was permitted (under a ruling of the attorney-general's office) to anticipate income for two years periods (instead of one) as a base for letting building contracts.

New Jersey court voids purchase of bridges

Ending three years of controversy, during which charges of fraud were prominent, the New Jersey Supreme Court last week voided the $12 million purchase of two bridges across the Delaware River.

The bridges involved are the Tacony, Pa.-Palmyra, N. J. and Burlington, N. J.-Bristol, Pa. structures. The organizations involved are Burlington County (N. J.) Bridge Commission and the Delaware River Joint Commission.

Controversy started late in 1948 (ENR Nov. 11, 1948, p. 74) when it became known that the county bridge group had purchased the two bridges from private owners. At the same time, a New York consulting engineering firm (Knappen, Tippets Abbett, McCarthy) submitted a report to the Delaware commission stating that the two bridges could be bought for $4,900,000, since both structures would soon be 20 years old, and thus available for purchase by the state.

Finance brief . . .

• **Buy Kentucky bonds**—The city of Paris, Ky., operating under the state's industry-attracting laws (ENR Jan. 17, p. 86) last week had sold $750,000 in industrial revenue-producing bonds to finance construction of a plant for the Detroit Harvester Co.

IN BUILDING SEWERS FOR THE YEAR 2000 TAMPA, FLORIDA CHOOSES *CONCRETE PIPE*

To eliminate dangerous and obnoxious pollution in the Hillsborough River and adjacent bay waters, Tampa, Fla. built an extensive new sewage system. Planned for the future, the system is designed to serve an expanding metropolitan area population that is expected to reach 335,000 by the year 2000, nearly triple Tampa's present population.

The new facilities include intercepting sewers, pumping stations, force mains, lateral sewer extensions, six crossings beneath river and harbor channels, a sewage treatment plant with a 36 mgd primary treatment capacity and a subaqueous outfall.

This huge system was built by several contractors. Greeley and Hansen of Chicago were the engineers for the entire project. Sizes and quantities of concrete pipe used are listed below.

Like Tampa, hundreds of other American cities have selected concrete pipe for dependable, economical sewer service. In many of these cities concrete pipe sewers have rendered ***low-annual-cost*** service for 70, 80, 100 years and more.

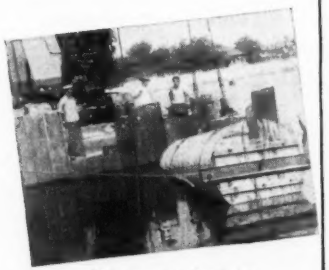
Concrete pipe has solved numerous difficult sewer problems because it has (1) the strength to withstand severe impact and to sustain heavy overburdens, (2) the smooth interior surface to resist abrasion and provide maximum hydraulic capacity and (3) the uniformly dense structure and tight joints to insure minimum infiltration and leakage.

Because concrete pipe is moderate in first cost, requires little or no maintenance and lasts so long, it delivers ***low-annual-cost*** sewer service. That is appreciated by civic officials and taxpayers alike.

PORTLAND CEMENT ASSOCIATION

33 WEST GRAND AVENUE, CHICAGO 10, ILLINOIS

A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work



48 in. concrete pipe being lowered for channel crossing

CONCRETE PIPE USED IN TAMPA SEWERS

13,500 ft.	60 in.	2,400 ft.	42 in.
16,300 ft.	54 in.	2,800 ft.	36 in.
21,000 ft.	48 in.	13,400 ft.	30 in.
2,900 ft.	27 in.		

CONCRETE PIPE IN SUBAQUEOUS OUTFALL

3,750 ft. 78 in.

CONCRETE PIPE IN RIVER AND CHANNEL CROSSINGS

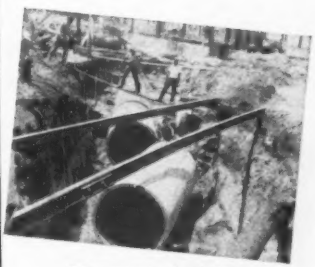
1,475 ft.	48 in.	320 ft.	36 in.

CONCRETE PIPE IN FORCE MAINS

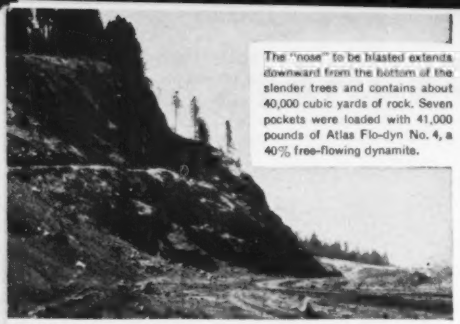
9,100 ft.	54 in.	250 ft.	48 in.
3,900 ft.	30 in.		

CONCRETE PIPE IN TREATMENT PLANT

1,650 ft.	84 in.	200 ft.	72 in.
215 ft.	54 in.		

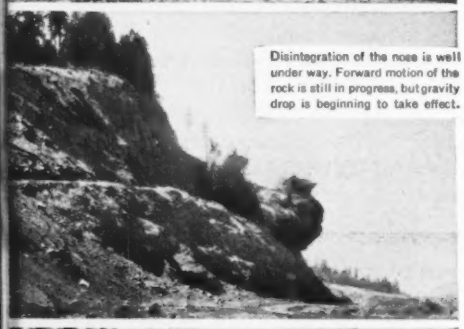


54 in. concrete pipe being placed under railroad switch tracks

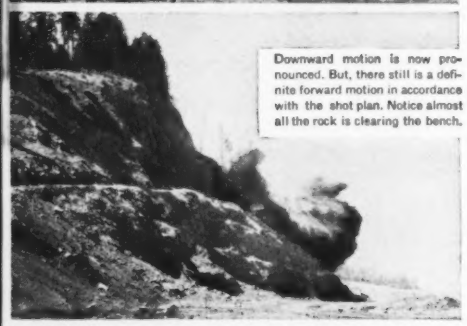


The "nose" to be blasted extends downward from the bottom of the slender trees and contains about 40,000 cubic yards of rock. Seven pockets were loaded with 41,000 pounds of Atlas Flo-dyn No. 4, a 40% free-flowing dynamite.

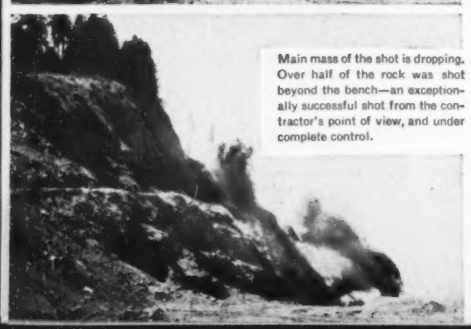
The action starts! The front moves out gaining assistance from the back. A pattern of Rockmaster milli-second delay detonators helped in directing the throw. Note confinement of explosives energy.



Disintegration of the nose is well under way. Forward motion of the rock is still in progress, but gravity drop is beginning to take effect.



Downward motion is now pronounced. But, there still is a definite forward motion in accordance with the shot plan. Notice almost all the rock is clearing the bench.



Main mass of the shot is dropping. Over half of the rock was shot beyond the bench—an exceptionally successful shot from the contractor's point of view, and under complete control.

ENGINEERING WITH ATLAS EXPLOSIVES

ROCKMASTER® BLASTING Reduces Costly Shovel and 'dozer Work

Oregon contractor employs Atlas milli-second delay system to make rock jump bench and land on valley floor.

Shovel work on a rough bench can be mighty expensive. Every cubic yard of rock that could be blasted off the "nose" and onto the valley floor meant substantial savings for the contractor on this highway and railroad re-location job near Lookout Point Dam, Oregon.

Leonard & Slate Ltd. of Oregon and E. C. Hall Company tackled the job with the milli-second delay action of the ROCKMASTER Blasting System. The result: over half of the rock was thrown to the valley floor. And they could have *kept the rock on the bench* if they wanted it there—thanks to ROCKMASTER's remarkable control over throw.

See how ROCKMASTER control can be put to work for *you*. Send for the free 20-page ROCKMASTER book showing typical loading patterns for all principal types of *controlled* blasting.

ATLAS EXPLOSIVES

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Dust begins to settle. Rock is well spread for the shovels—on the valley floor. Controlled blasting saved a lot of costly work on the bench with shovels and bulldozers.

CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ELSIE EAVES, Manager — *J. A. MAHONEY, Reports* — *M. R. ROESSLER, Statistics*

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

† **Massachusetts**—B.A. About 3/1—U. S. Eng., 80 Lafayette St., New York 13, N. Y., channel excav., constr. 650 ft. concrete chute in Junction Reach Hoosic River Basin, $100,000-$500,000. CD 12/12.

BIDS ASKED—BUILDINGS

Mass., Quincy—POWER PLANT—B.A. 2/8—City, P. Wks. Dpt., City Hall Annex, power plant, $500,000. Plans deposit $50, refundable $25, Coletti Bros., 687 Boylston St., Boston, archts. Office of Hollis French, 210 South St., Boston, heating engr. CD 8/20/48.

▲ **R. I., Woonsocket**—HOUSING—B.A. 2/8—Woonsocket Housing Auth., 66 Morin Heights Blvd., R. I. 3-2, superstructure housing, Lothrop Property Fairmont Sect. off Mason and Asylum Sts. Plans deposit $100. CD 3/26/48.

Mass., Brockton—CHURCH and RECTORY—B.A. 2/12—Our Lady of Lourdes, c/o Chancery Office, Lake St., Brighton, church and rectory, $300,000. Richard D'Orsi & Co., 184 Boylston St., Boston, archts. CD 1/16.

Mass., Chelmsford—SCHOOL—B.A. 2/14—Town, Supt. Schools, Billerica Rd., school, Groton Rd., North Chelmsford. $510,000. Plans deposit $50. S. W. Haynes & Assoc., 336 Main St., Fitchburg, archts. CD 8/22.

▲ **Mass., Methuen**—SCHOOL—B.A. 2/29—Town, supt. Schools, Methuen, high school, Pleasant St., $1,600,000. Plans deposit $50. Edmund I. Leeds & Assoc., Inc., 153 Brighton Ave., Allston, archts. CD 11/9.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

MASSACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
The Savin Constr. Corp., 10 Village St., Hartford, Conn. LB $939,703, est. $1,050,000. Contr. A south end bridge substructure, 6 piers and 2 abutments over Connecticut River, West Springfield and Agawam, Bids Jan. 15. CD 12/31.

† **D. C. Loveys Co.**, 1430 Massachusetts Ave., Cambridge, Mass. LB $194,316, est. $150,000. rehabilitate certain buildings and limited services, Naval Air Station, South Weymouth, Spec. 29234, WEYMOUTH, MASS. First Naval Dist., 495 Summer St., Boston, Mass. Bids Jan. 15. CD 1/8.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **S. Volpe & Co., Inc.**, 185 Devonshire St., Boston, Mass. CA $1,580,510. John Corcoran HOUSING, Proj. PHA 3-2, Thingvalla Ave., Cushing Court and Corcoran Park, CAMBRIDGE, MASS. Cambridge Housing Auth., 51 Inman St., Cambridge, Mass. Awarded Jan. 18. CD 11/30, under LB.

▲ **Gil Wyner Co., Inc.**, 12 Newland St., Malden, Mass. LB $2,533,000, est. $2,500,000. 250 HOUSING units, Proj. PHA 22-1, Bryant St. near Everett Line, MALDEN, MASS. Malden Housing Auth., Aldermanic Chambers, City Hall, Malden, Mass. Bids Jan. 18. CD 12/27.

▲ **The Wadhams & May Co.**, 15 Lewis St., Hartford, Conn., LB, $1,136,645, Junior-Senior High SCHOOL, GLASTONBURY, CONN. Town Bd. Educ., Glastonbury, Conn. Bids Jan. 11. CD 1/4.

Aaron Dubitzky, 18 Pontiac Rd., East Hartford, Conn., Owner Builds, $750,000, 1 story, brick, concrete type-garden apartments, 8 Ave. tract off Lawrence St., EAST HARTFORD, CONN.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

N. J., West New York—B.A. 2/20—Town Bd. Comrs., Town Hall, sewage disposal plant, Frank J. Oleri, 6032 Bergenline Ave., engr. CD 1/25, under LB.

† **N. Y., Rome**—ELECTRONIC TEST FACILITIES—B.A. About 3/6—U. S. Eng., 80 Lafayette St., New York, Zone 13, electronic test facilities at Griffis Air Force Base. $818,000. Alexander D. Crossett, 27 William St., New York, Zone 5, engr. CD 9/14.

▲† **N. Y., Rome**—LABORATORY, etc.—B.A. About 4/17—U. S. Eng., 80 Lafayette St., New York, Zone 13, aero recon. laboratory, training aide bldg., transmitter bldg., rocket storage and navigation aids at Griffiss Air Force Base, $2,714,000. Alexander D. Crosett, 27 William St., New York, Zone 5, engr. CD 9/14.

BIDS ASKED—BUILDINGS

D. C., Wash.—SCHOOL—B.A. 2/5—Dist. of Columbia Dir. Construction, 14 and E Sts., N.W., Zone 4, Payne School addn., E.D. 258568-15. Plans deposit $25. CD 6/14/3.

▲† **D. C., Wash.**—HOUSING—B.A. 2/13—National Capitol Housing Auth., 178 L St., N.W., Wash., 25, D. C., Proj. D.C. 1-170, Richardson Dwelling Housing, incl. 190 units, $2,000,000. Albert Goldberg, 739 Boylston St., Boston, Mass., structural engr. Gorden E. McNeill Assoc., 561 Boylston St., Boston, Mass., engrs. Samuel Glaser, 105 Newbury St., Boston, Mass., archt. CD 12/20.

▲† **Md., Fort George G. Meade**—BARRACKS, etc.—B.A. 2/14—U. S. Eng., 24 St. and Maryland Ave., P. O. Box 1715, Baltimore, Zone 3, 12 barracks, regimental headquarters, 3 battalion headquarters, 2 bachelor officers quarters, 3 battalion motor repair shops, central heating plant, warehouse, warehouse exten., regimental warehouse, fire station, cold storage plant, outside utilities incl. site imprvs., Eng. 18-020-52-27. Plans deposit $50. CD 1/4.

▲ **N. J., Raritan**—ARSENAL IMPRVS.—B.A. 4/11—U. S. Eng., 80 Lafayette St., New York 13, N. Y., hard standing areas at Raritan Arsenal, $1,790,000. Frank Grad, 48 Commerce St., Newark, engr.

▲ **N. Y., Sampson**—HOUSING—B.A. About 6/1—U. S. Eng., 80 Lafayette St., New York, Zone 13, construct, manage, finance, 1,000 unit Wherry Housing at Sampson Air Force Base. $10,500,000. Backus, Crane & Love, 232 Delaware Ave., Buffalo, archts. CD 11/15.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 N. Office Bldg., Harrisburg,
C. F. Goeringer Constr. Co., Inc., 73-75 E. Market St., Wilkes-Barre, Pa., LB $252,982, bit. surf. 27,595 ft. existing pavement, T.R. 115, 315, Luzerne Co.;
Latrobe Road Constr. Co., P.O. Box 150, Latrobe, Pa., LB $321,079, crushed aggregate base with 7,489 ft. roadway 28 ft., bit. surf. 6 ft. wide, L.R. 64235 (1), Westmoreland Co.;
Charles A. Imel & Son, 34 Greenville Ave., Clarion, Pa., LB $402,961 wid'n. and build-up 13,989 ft. existing pavement with crushed aggregate base and bit. surf. T.R. 68 U.S. 322, Clarion Co.;
E. D. Plummer & Sons, Chambersburg, Pa., LB $279,901, with crushed stone base course and bit. surf. 22,369 ft. roadway L.R. 28009 (1), Franklin and Cumberland Counties;
The Kelley & Meyer Co., 1211 Gibson St., Youngstown, O., LB $76,126, bit. surf. 24,598 ft. existing pavement 20 ft. wide, T.R. 18, Lawrence Co.;
New Enterprise Stone & Lime Co., Inc., New Enterprise, Pa., LB $561,707, wid'n. 9,094 ft. existing roadway with plain c. conc. base and bit. surf. new and existing base, T.R. 36220, Blair Co.;
Beaver Asphalt Paving & Constr. Co., Box 104, New Brighton, Pa., LB $178,275, bit. surf. 7,171 ft. existing pavement T.R. 88, Beaver Co. Bids Jan. 18. CD 12/28.
A. J. Ellis Constr. Co., 1178 Morse St. N.E., Wash., D. C., LB, $50,140, trunk water main E.D. 263739-3, WASH., D. C. Dist. of Columbia, Sanitary Eng., 14 and E Sts. N.W., Wash., 4, D. C. Bids Jan. 3. CD 12/17.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction

(Name in order of Listing)

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Latin America
Public Buildings
Commercial Buildings
Industrial Buildings
Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
B.A. Bids Asked
ENR Engineering News-Record
CD Engineering News-Record Construction Daily

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **George F. Driscoll & Moccia Constr. Corp.**, 41 E. 42 St., New York 17, N. Y., LB $5,672,670, general constr.;
Nager Electric Co., Inc., 426 Broadway, Brooklyn 11, N. Y. LB $420,000, electrical work;
Raisler Corp., 129 Amsterdam Ave., New York 23, N. Y., LB $766,700, heating and ventilating;
Jesse E. Kahn, Inc., 131 W. 21 St., New York 11, N. Y., LB $693,479, plumbing for Van Dyke Houses, Proj. No. BT 5-13, Sect. I, incl. bldgs. Nos. 1 to 13 (inclusive) in area bounded by Sutter Ave., Powell St., Blake Ave., Stone Ave. and by Blake Ave., Christopher St., Dumont Ave. and Stone Ave., BROOKLYN, N. Y. New York City Housing Auth., 63 Park Row, New York 7, N. Y. Bids Jan. 18.
▲ **Sanderson & Porter**, 52 William St., New York 5, N. Y. CA. Total est. $18,000,000. design and construct POWER PLANT addn. and coal handling facilities. SPRINGDALE, PA. West Penn Power Co., West Penn Bldg., Pittsburgh, Pa. CD 11/12.
† **Piracci Constr. Co.**, 2452 Woodbrook Ave., Baltimore, Md. LB $618,000. rein.-con., steel, brick, concrete block fire bomb cluster and ASSEMBLY BLDG., Eng. 18-020-52-21, EDGEWOOD, MD. U. S. Eng., 24 St. and Maryland Ave., P.O. Box 1715, Baltimore 3, Md. Bids Jan. 17. CD 1/8.
J. D. Hedin Constr. Co., 2900 Newton St. N.E., Wash., D. C., LB $749,000, Hugh M. Browne Junior High School addns., WASH., D. C. Dist. of Columbia, 14 and E Sts. N.W., Wash., 4, D. C. Bids Jan. 10. CD 7/12/44.
Merando, Inc., 813 4 St. N.E., Wash., D. C., LB, $485,000, Adelaide Davis SCHOOL addn., E.D. 26-3245-1, WASH., D. C. Dist. of Columbia, Dir. of Constr., 14 and E Sts. N.W., Wash., 4, D. C. Bids Jan. 8. CD 12/17.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

† **Va., Arlington**—DORMITORY—B.A. After 1/22—U. S. Eng., First and Douglas Sts. N. W., Wash. 25, D. C., construct 500 airmen's dormitory in vicinity of Washington National Airport. Serial No. ENG 49-080-52-41-(32). Plans deposit $20.

† **Ga., Albany**—ELECTRICAL DISTRIBUTION SYSTEM B.A. 2/12—Dpt. Navy, Officer in Charge of Construction, Box 365, Naval Base, S. C., electrical distr. sys. at Marine Corps. Depot of Supplies, NOY 70661. Extended date. CD 1/18.

† **Louisiana**—B.A. 2/14—U. S. Eng., P. O. Box 60, Vicksburg, Miss., restoration approx. 985 stations of levee and dike, placing approx. 16,000 cu. yd. embankment, excav. approx. 700 cu. yd. embankment, placing approx. 440 cu. yd. grav. surf., installing 36 lin. ft. culvert pipe, placing 100 cu. yd. of riprap on West bank of Mississippi River, CIVENG 22-052-52-110, Concordia Parish. CD 6/26/46.

† **South Carolina**—B.A. 2/14—U. S. Eng., 33 Customhouse, Charleston, Charleston Small Boat Wet Storage Basin, Goose Creek, North Charleston, Serial No. ENG 38-081-52-24.

† **Fla., Bay Pines**—B.A. 2/19—Veterans Admin., Munitions Bldg., Wash., 25, D. C., Incinerator Bldg. No. 79, Proj. No. 5-4207.

† **Louisiana and Mississippi**—B.A. 2/19—U. S. Eng., P. O. Box 1169, 2301 Grant St., Mobile 7, Ala., constr. Bogue Chitto and Pools Bluff Sills in Pearl River, Bogalusa, La. and Mississippi, CIVENG 01-076-52-39. Plans deposit $10. CD 6/26/46.

Fla., Orlando—DORMITORIES, etc.—B.A. On or About 2/29—U. S. Eng., P. O. Box 4970, Jacksonville, airmen's dormitories and mess hall, Pine Castle Air Force Base, Serial No. ENG 08-123-52-105. CD 1/31.

† **VIRGINIA**—B.A. About 3/28—U. S. Eng., P. O. Box 119, foot of Front St., Norfolk, Zone 1, 3.1 mi. secondary road, $100,000-$500,000.

BIDS ASKED—BUILDINGS

† **Va., Norfolk**—BUILDING REPAIRS—B.A. 2/5—Pub. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Zone 11, repairing building at the U. S. Naval Base (Fleet Recreation Park). NOY 71273, Spec. 32843. Plans deposit $10.

† **Va., Dahlgren**—DORMITORIES—B.A. 2/6—Potomac River Naval Command, Naval Gun Factory, Wash. 25, D. C., civilian male and female dormitories at Naval Proving Ground, NOY 70545. Plans deposit $30.

▲ **Ky., Newport**—HOUSING—B.A. 2/8—Newport Municipal Housing Comn., 401 Finance Bldg., housing $3,500,000. Meriwether Marye & Assoc., 236 E. Short St., Lexington, archts. CD 1/31/50.

▲ **Tenn., Nashville**—HOUSING—B.A. About 2/10—Nashville Housing Auth., 701 S. 6 St., 550 housing units. $4,000,000. CD 9/20.

▲ **Ga., Valdosta** — HOUSING — B.A. 2/12 — Valdosta Housing Auth., Valdosta, 250 unit housing, Projs. GA 100-3 and 100-4. $2,000,000. Plans deposit

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"Years ago I did a great deal of wasteful calling, chasing down rumors and making routine calls on regular customers. These consumed much valuable time, both mine and theirs. If it had not been for the longer hours people worked I would have had little time left for beating the bushes, as we had to, in order to find prospects with a current need for our product.

"When my firm started providing me with Dodge Reports, I was a little skeptical, felt I knew everything that was going on in my territory. But I soon found that without the reports I would have missed some good sales opportunities and been too late on others. I began to cut down on useless calls and yet my customers sometimes credited me with mind reading when I called at just the right time. Those Dodge sleuths are really something in performing the first step in my sales, discovering a prospect with a current need for my product. Over the years Dodge Reports have helped me make many contacts of lifetime value I might otherwise never have made. Dodge Reports are today an indispensable part of my way of doing business."

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If you have not seen this book, send for it at once. It will help you sell more and sell more easily. *No obligation*, just send us your name, your company, your address, your title, if any. Do it NOW. We want you to have this book, the result of 60 years of service to salesmen in the construction field.

**George Green is not the name of any one salesman. The statements above are a composite of what many successful salesmen in the construction field have told us.*

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- Prestressed Tanks
- Repair all Types Disintegrated Concrete
- Dam Reconstructing and Repairs
- Linings and Repairs to Reservoirs, Stacks, Bunkers, Sewers, Tanks, Tunnels, Pen Stocks
- Structural Steel Encasements
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$100. Felton, Davis & J. B. Addy, 1501 Slater St., archts. CD 12/4.

S. C., Charleston—HOUSING—B.A. 2/14—Charleston Housing Auth., 20 Franklin St., Proj. SC-19, construct 6 bldgs., containing 27 dwellings, Mount Pleasant. Plans deposit $30. Harold Tatum, 10½ Exchange St., A. E. Constantine, 139 Calhoun St., and L. C. Gaillard, 183 King St., all Charleston, archts. CD 12/13.

† **Va., Fort Lee**—BARRACKS—B.A. 2/14—U. S. Eng., foot Front St., Norfolk, Zone 1, one 450-man (EM) barracks, ENG 44-110-52-19 (B).

† **Va., Warrenton** — WAREHOUSE — B.A. 2/14 — U. S. Eng., First and Douglas Sts. N. W., Wash. 25, D. C., warehouse operations area at Vint Hill Farms Station, ENG 49-080-52-51-(41). Plans deposit $10. CD 12/12.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **McCoy-Helgerson Co.**, Greenwood, S. C., LB **$756,109**, Alt. 1, $504,788, Alt. 2, barracks bldgs., etc., No. 38-084-52-10. Donaldson Air Force Base, GREENVILLE, S. C. U. S. Eng., 33 Customhouse, Charleston 1, S. C. Bids Jan. 14. CD 12/31.

† **U. S. Eng.**, Post Office Bldg., Savanah, Ga., cancelled bids to have been opened Jan. 23, motor pool at Hunter Air Force Base, ENG 09-133-52-46, SAVANNAH, GA. Will re-advertise. CD 1/3.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

† **MICHIGAN**—B.A. 2/6—U. S. Eng., 1900 Cadillac Tower, Detroit, Zone 26,

Macomb Co.—modification of Van Dyke Rd. and mound road west Lane Bridges F crossing red run near Warren, CIVENG 20-064-52-30B.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

WISCONSIN—State Hy. Comm., Madison,
Wm. E. Brinkman, Oconomowoc, Wis., LB, **$334,672**, Structures B-40-1, B-40-2, B-40/67-4, West Granville-Waukesha Co. Line (North Interchange) Road, S. T. Hy. 35 and U. S. Hys. 41 and 45, Cont. 1, Proj. F 03-1 (23), Milwaukee Co. Bids Jan. 15. CD 12/28.

WISCONSIN—State Hy. Comm., Madison,
L. G. Arnold, Inc., Eau Claire, Wis., LB, **$88,389** Contract 1, grading, draining 5.354 mi. The Centerville-Arcadia Road, S. T. Hy. 93, Proj. T 0119 (2), Cont. 1, Trempealeau Co.;

Payne & Dolan of Wisconsin, Inc., 735 N. Water St., Milwaukee, Wis., LB, **$137,604**, Contr. 1, b. conc. 4.01 mi. The S.T.H. 36-Hales Corners and South 109 St.—Hart (Village of Hales Corners) Road, Proj. T 059-1 (4) and T 0618 (2), S.T. Hys. 100 and 24, Milwaukee Co. Bids Jan. 15. CD 12/28

BUILDINGS

LOW BIDS AND CONTRACTS

Prosperity Constr. Co., 1111 A North Compton Ave., St. Louis 6, Mo., CA, Approx. **$340,000** CIVIC (community) CENTER, BROOKLYN (Lovejoy P.O.) ILL. Bd. Managers Stites Twp., John Johnson, ch. Brooklyn, Ill. Bids Jan. 4. CD 12/14.

▲ **J. J. Altman & Co.**, 1764½ State St., East St. Louis, Ill., LB, **$1,045,235**, Proj. Ill. 15-7, 17 two story bldgs. incl. 100 dwelling units and 1 maintenance bldg;

M. H. Wolfe & Co., 1877 Pontoon Rd. Nameoki, Ill., LB, **$534,600**, Proj. 15-9 11 two story bldgs. incl. 50 dwelling units, and 1 story maintenance bldg., VENICE, ILL. Madison County Housing Auth., O. F. Braner, exec. dir., 3 and Haller Sts., East Alto, Ill. Bids Jan. 11. CD 12/11.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

† **Colorado**—VALVES, etc.—B.A. 2/7—Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver, 84-inch butterfly valves, operating units and handling equipment for Flatiron Power and Pumping Plant, Colorado-Big Thompson Proj., Spec. DS 3608. Extended date. CD 12/27.

† **Tex., Big Spring**—WAREHOUSE—B.A. 2/8—U. S. Eng., 1127 Texas & Pacific Bldg., Fort Worth, base supply warehouse. Approx. $200,000. CD 8/8.

† **Tex., Fort Worth**—TAXIWAY—B.A. 2/19—U. S. Eng., 1127 Texas & Pacific Bldg., taxiway for Carswell Air Force Base. Approx. $100,000. CD 7/19.

† **Tex., Big Spring**—AIR INSTALLATIONS—B.A. 2/21—U. S. Eng., 1127 Texas & Pacific Bldg., Fort Worth, air installations, office-administration; auto shop; air-installations shop. Approx. $500,000. CD 8/8.

▲† **Tex., Waco**—WAREHOUSING—B.A. 2/21—U. S. Eng., 1127 Texas & Pacific Bldg., Fort Worth, 108,000 sq. ft. base warehousing for Connally Air Force Base. $1,000,000. Extended date. CD 10/17.

† **Tex., Big Spring**—PARKING—B.A. 2/22—U. S. Eng., 1127 Texas & Pacific Bldg., Fort Worth, parking areas const. and paving, access road. Approx. $75,000. CD 8/8.

† **Tex., Mineral Wells**—MESS BLDGS.—B.A. 2/22—U. S. Eng., 1127 Texas & Pacific Bldg., Fort Worth, 3 mess bldgs. Approx. $300,000. CD 7/16.

† **Tex., Waco**—B.A. 2/28—U. S. Eng., 1127 Texas & Pacific Bldg., Fort Worth, water supply well, treat-

ment unit, distr. lines. Approx. $75,000. CD 11/13, under LB.

† **Tex., Big Spring**—HOUSING—B.A. 2/29—U. S. Eng., 1127 Texas & Pacific Bldg., Fort Worth, family housing. Approx. $300,000. CD 8/8.

† **Tex., Mineral Wells**—AUTOMOBILE SERVICE AREA—B.A. 3/14—U. S. Eng., 1127 Texas & Pacific Bldg., Fort Worth, automobile service area. Approx. $75,000. CD 7/16.

BIDS ASKED—BUILDINGS

▲ **Tex., Harlingen**—HOUSING—B.A. 2/8—Harlingen Housing Auth., Harlingen, 48 three-bedroom housing units, $383,000; 52 one-bedroom housing units, $368,000; 50 one to four-bedroom housing units, $375,000. Cocke, Bowman & York, 1220 W. Harrison St., archts. CD 1/24/50.

▲ **Tex., Fort Worth**—HOUSING—B.A. 2/12—Fort Worth Housing Auth., c/o Lealand Hunter, exec. dir., 500 W. Belknap St., 310 brick, tile Negro housing units in 62 bldgs., in 4900 blk. E. Rosedale St. $2,300,000. Plans deposit $50. Chromaster, Geren and Wilson & Patterson, 202 Majestic Bldg., archts. Carter & Burgess, Century Bldg., engrs. CD 9/15/49.

▲ **Tex., Austin**—SCHOOL—B.A. 2/14—Bd. Trustees Austin Independent School Dist., 701 E. 11 St., 1 story, concrete frame, precast slabs, steel deck floor, brick exterior, tile, brick and plaster interior McCallum High School. Approx. $1,000,000. Page, Southerland & Page, 602 West Ave., archts. Zumwalt & Vinther, Mercantile Securities Bldg., Dallas, mechanical engrs., R. J. Cummins, Bankers Mortgage Bldg., Houston, structural engr.

Tex., Austin—ADMINISTRATION—B.A. 2/18—State of Texas, Dpt. P. Safety, Homer Garrison, dir., Camp Mabry, administration bldg. $350,000. Former bids rejected. Kuehne, Brooks & Barr, 203 Perry-Brooks Bldg., archts. Wilson & Cottingham, Littlefield Bldg., and Landauer & Guerrero, 4801 Lemmon Ave., Dallas, engrs. CD 7/21/49.

SOON LETS CONTRACT—HEAVY CONSTRUCTION

Mo., Cameron—POWER MATERIALS—Northwest Electric Power Co-operative, Inc., Cameron, soon lets contract, power materials, supplies and equip. $500,000. Lutz & May, 819 Finance Bldg., Kansas City 6, Mo., consult. engrs. CD 3/2/50, under Missouri.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **S. Patti Constr. Co.**, 1340 Admiral Blvd., Kansas City 1, Mo. LB **$1,086,323**, est. $995,000. East Side sewerage sys., treatment plant, 2 pumping stations, INDEPENDENCE, MO. City, c/o Mayor Robt. P. Weatherford Jr., City Hall, Independence, Mo. Bids Jan. 14. CD 1/2.

▲ **Peter Kiewit & Sons**, Airport Branch P.O., Wichita, Kan. CA **$2,049,857**. concrete parking apron Smoky Hill Air Force Base, Eng. 23-028-52-6, near SALINA, KAN. U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo. Awarded Jan. 14. CD 1/3, under LB.

Poston Sand & Gravel Co., Lawton, Okla., CA. **$248,480**. c. conc. paving 22 residence blocks, LAWTON, OKLA. City, Lawton, Okla. Awarded Dec. 20. CD 10/24.

TEXAS—State Hy. Comn., Austin,
R. B. Butler, Inc., P.O. Box 471, Bryan, Tex., LB **$248,263**, est. $175,000. bridges, approaches on Hy. U.S. 287, Proj. F 712 (1), Anderson Co. Bids Jan. 16. CD 1/4.

▲ **TEXAS**—State Hy. Comn., Austin,
E. W. Hable & Sons, Corsicana, Tex., LB **$62,526**, grading, structures, base and surf., 7.817 mi. Hy. FM 645, Proj. S 1827 (1), Anderson Co.;
H. B. Zachry Co., P.O. Box 2570, San Antonio, Tex., LB **$72,941**. hot mix b. conc. pavement 7.74 mi. Hy. U.S. 287, Proj. F 449 (4), Clay Co.;
Kerr & Middleton, 2206 Colvis Rd., Lubbock, Tex., LB **$83,959**, est. $60,000. flexible base, 3-course surf. tr. 3.277 mi. Hy. U.S. 87, C 68-4 and 5- 9 and 12, Dawson Co.;
Gulf Bitulithic Co., P.O. Box 2572, Houston 1, Tex., LB **$1,109,604**. grading, storm sewers, flexible base, asph. surf., c. conc. 1.905 mi. Hy. U.S. 59, Proj. U. 514 (3), Harris Co.;
Brown & Root, Inc., P.O. Box 3, Houston, Tex., LB **$149,287**. flexible base, b. conc. 3.386 mi. Hy. Loop 137, Proj. F 1057 (3), Harris Co.;
Menefee Bros. & Alford, P.O. Box 431, Center, Tex., LB **$60,882**, est. $60,000. grading, structures, base and surf. 4.939 mi. Hy. FM 1747, Proj. S 1849 (1), Jasper Co.;
Bryan & Hoffman, P.O. Box 390, Plainview, Tex., LB **$141,645**, est. $100,000. grading, structures, base and surf. 7.941 mi. Hy. FM 1231, Proj. V 1361-3-3, Scurry Co.; LB **$155,328**, est. $175,000, flexible base, 2 course surf. tr. 11.568 mi. Hy. U.S. 82, Proj. F 910 (4), Knox Co.;
T. R. Vardeman & Son, P.O. 485, Nacogdoches, Tex., LB **$66,906**, est. $60,000. grading, structures, base and surf. 6.538 mi. Hy. FM 1638, Proj. S 1649 (1), Nacogdoches Co.;
South Texas Constr. Co., P.O. 3536, Corpus Christi, Tex., LB **$117,005**, est. $75,000. b. conc. 22.956 mi. Hy. SH 155, Proj. F 652 (16), Smith, Henderson and Anderson Counties;
Ernest Loyd, P.O. Box 1120, Fort Worth 1, Tex., LB **$70,057**, est. $60,000. grading, structures, base and surf. 8.967 mi. Hy. FM 847; Proj. S 1808 (1), Terry Co. Bids Jan. 16. CD 1/4.
Christianson, Inc. and Lewis O. Tyra, 2405 San Jacinto St., Houston, Tex., Own Forces. **$40,000**. water lines, HOUSTON, TEX. CD 9/26.
Miles Strickland, 1508 Fannin St., Houston, Tex., Own Forces. **$45,000**. water lines, facilities, HOUSTON, TEX.

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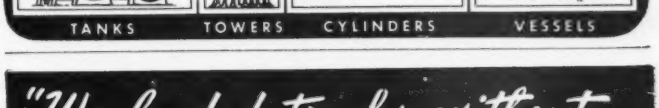

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Christianson, Inc., & Lewis O. Tyra, 2405 San Jacinto St., Houston, Tex., Own Forces. **$65,000,** sanitary sewers; **$62,000,** storm sewers, HOUSTON, TEX. CD 9/26.

Miles Strickland, 1508 Fannin St., Houston, Tex., Own Forces. **$65,000.** storm sewers, site earthwork; sanitary sewers, **$60,000.** HOUSTON, TEX. CD 1/4.

Christianson, Inc. & Lewis O. Tyra, 2405 San Jacinto St., Houston, Tex., Own Forces. **$72,500,** street constr. and asph. paving, HOUSTON, TEX. CD 9/26.

Miles Strickland, 1508 Fannin St., Houston, Tex., Own Forces. Approx. **$70,000.** street constr. and asph. paving, HOUSTON, TEX.

BUILDINGS

LOW BIDS AND CONTRACTS

S. Patti Constr. Co., 1340 Admiral Blvd., Kansas City 1, Mo. LB 50x100 ft. FACTORY, KANSAS CITY, MO. Haver Glover Laboratories, 19 Terrace and Broadway, Kansas City 8, Mo. Geo. B. Franklin, 800 Temple Bldg., Kansas City 6, Mo., archt.

A. Henson, Abilene, Tex., Own Forces. Approx. **$340,000.** 45 DWELLINGS, ABILENE, TEX. CD 1/11.

Lone Star Gas Co., 1915 Wood St., Dallas, Tex., Own Forces. **$550,000.** SERVICE CENTER incl. 64,000 sq. ft. WAREHOUSE, at Oak Cliff, DALLAS, TEX. CD 11/9.

W. D. Ferguson & Sons, Box 446, Brownsville, Tex., LB **$307,181,** est. $300,000. Gay Junior HIGH SCHOOL, HARLINGEN, TEX. Harlingen Independent School Dist., Harlingen, Tex. Bids Jan. 11. CD 12/18.

Paul Canto, 312 Hyde Park, Houston, Tex., Own Forces. $300,000. 25 DWELLINGS, HOUSTON, TEX. CD 1/11.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

Calif., El Cajon—B.A. 2/11—City, 235 Highland Ave., sanitary sewerage sys., treatment plant, water well, etc. $600,000. Currie Eng. Co., Andreson Bldg., San Bernardino, engr. CD 11/5.

† **Idaho**—B.A. 2/28—Bureau Reclamation, Dpt. Interior Bldg. 53, Denver Federal Center, Denver, Colo., portland cement and pozzolan for Palisades Dam and Power Plant, Palisades Proj., Spec. DS 3622. Extended date. CD 1/4.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

WASHINGTON—State Hy. Dpt., Olympia.

State Constr. Co., 1245 Poplar Pl., Seattle Wash., **CA, $186,685,** est. $200,000. steel, rein.-con. girder overcrossing over NP and Milwaukee R.R. tracks on Hy. 1 at Chehalis, Lewis Co.;

Carl M. Halvorson, Inc., 3818 N.E. Sandy St., Portland, Ore., CA **$185,736,** est. $225,000. rein.-con. girder undercrossing and detour road at junction of Hys. 1 and 8, Vancouver, Clark Co. Bids Jan. 15, awarded Jan. 15. CD 1/3.

† **Barding Equip. Co.,** 4335 Hollister Ave., Santa Barbara, Calif., CA, **$250,000,** aircraft fueling system at Oxnard Air Force Base, OXNARD, CALIF. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. CD 5/21.

ALASKA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Puget Sound Bridge & Dredging Co., and Johnson, Drake & Piper Inc.,** 2929 16 Ave., S. W., Seattle, Wash., LB **$5,248,000,** est. $6,022,000. transmitter facilities, maintenance roads and antennae, taxiway extens. and road relocation at Naval Base, KODIAK, ALASKA, Pub. Wks. Officer, 17th Naval Dist., Box 38, Navy 127, c/o PM, Seattle, Wash. Bids Jan. 15. CD 11/27.

CANADA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Govt. of Canada, Dpt. National Defence ARMY, Cartier Sq., Ottawa, Ont., rejected bids Nov. 6, water treatment plant intake, BARRIEFIELD, ONT. CD 10/24.

Shawinigan Water & Power Co., Ltd., 600 W. Dorchester St., Montreal, Que., Own Forces, power transmission line, CAP DE LA MADELEINE, QUE.

J. H. Dupuis Ltd., 4324 Jeanne d'Arc, Montreal, Que., CA, $490,951., reconstructing BARRACKS blocks for married personnel, LACHINE, QUE. Govt. of Canada, Dpt. National Defence AIR, Cartier Sq., Ottawa, Ont. Defence Constr. (1951) Ltd., 70 Lyon St., Ottawa, Ont., engrs.

Piggott Constr. Co., Ltd., Saskatoon, Sask., CA, $157,474, water pump house and sewerage treatment plant, SASKATOON, SASK. Govt of Canada, Hunter Bldg., Ottawa, Ont. Defence Constr. 1951 Ltd., 70 Lyon St., Ottawa, Ont., engr.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Domex Co., Ltd.,** 112 Bond St., Toronto, Ont., CA. Approx. $5,000,000, PLANT UNIT incl. 2 bldgs., 100x400 ft. and 80x200 ft., all steel frame, 7 mi. east of EDMONTON, ALTA. Canadian Chemical Co. Ltd., Edmonton, Alta. Morin, Rensaa & Minsos, Mac Cosham Bldg., Edmonton, Alta., archts. and engrs. CD 8/29.

▲ **Coles Jeffrey Constr. Ltd., Front St., Sarnia, Ont., CA $1,364,500, general constr.;**

Spiers Plumbing & Heating Co., Sarnia, CA **$326,204,** plumbing and steam heating, HOSPITAL addn., SARNIA, ONT., Sarnia General Hospital Bd., Sarnia, Ont. Bids Dec. 24, awarded Jan. 16. CD 11/29.

▲ **Norman & Walter Collins,** Port Credit, Ont., CA, $3,000,000 housing, SARNIA, ONT. A. M. Greenaway & Co., 169 Yonge St., Toronto, Ont. Awarded Jan. 15. CD 1/4.

▲ **F. Jobin, Inc.,** 26 Cartier St., Quebec City, Que., CA $1,055,000, reconstructing PLANT, for Canadian Arsenals Ltd., QUEBEC CITY, QUE. Govt. of Canada, Dpt. National Defence Army, Cartier Sq., Ottawa, Ont.

Biron Constr. Co., Inc., 998 Cherrier St., Montreal, Que., Owner Builds, $500,000, 52 two story, bsmnt., brick DWELLING UNITS, VARENNES, QUE.

LATIN AMERICA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Morrison-Knudsen De Venezuela, c/o Morrison-Knudsen Co., Inc., 122 E. 42 St., New York 17, N. Y., CA. 90 mi. standard gage Class A railroad from Puerto Ordaz to Cerro Bolivar Mine and 90 mi. highway, VENEZUELA. Orinoco Mining Co., 25 Broad St., New York, N. Y. CD 1/16, under CA.

PROPOSED PROJECTS

WATER SUPPLY

▲ **Ill., East Moline**—City, filtration plant, **$1,000,000.**

N. Y., Syracuse—City, City Hall, **(1)** construct addni. sect. to conduit 3 (from Skaneateles Lake) from the Stone Hedge golf course, Camillus to the Geddes gate house, 7,500 ft. long, 48 in. in dia., est. **$294,000;** **(2)** construct auxiliary feeder 5,600 ft. long from the end of the 48 in. feeder from Es Westcott Reservoir to Geddes and Delaware Sts., to the downtown area. This would be a 36 in. line to connect with the 24 in. main in Montgomery St., near City Hall, extens. to Marcellus and West Sts. with addnl. extens. later. **$520,000.** Nelson F. Pitts, city engr. CD 11/28/45.

N. C., Leaksville—Town, John Smith, mayor, Leaksville, enlarging city water sys., extend present sewer lines, $850,000. Wm. C. Olsen, 5 Exchange Pl., Raleigh, consult. engr.

O., Dayton—City Comn., City Hall, 1952 water supply and feeder lines, **$277,725.** Loyd C. Huffman, city water dir. CD 5/27/49.

† **Alaska, Cordova**—Alaska P. Wks., Dpt. Interior, Juneau, enlarge. imprv. municipal water sys., 50-A-116. $132,600. F. J. Toner, Juneau, consult. engr. CD 3/15/51.

Alaska, Wrangell—City, City Hall, plans by Angus McSweeney, 514 Mission St., San Francisco, Calif., water sys. **$189,000.** CD 7/27/50.

Que., Three Rivers—Municipality, water works, **$800,000.** R. Lord, City Hall, city engr. CD 3/10/50.

SEWERS, WASTE DISPOSAL

▲ **Mass., Boston**—State, Metropolitan Dist., Comn., Constr. Div., 20 Somerset St., relief sewer, North Charles River; relief sewer, South Charles River; sewer tunnel 4 mi., Deer Island to Chelsea Creek; rehabilitation tide gate and pumping station, Deer Island; marginal conduit pumping station, Deer Island; sewage pumping, Deer Island; sewage treatment and disposal plant, Deer Island, outfall sewage, Deer Island; sewer Head Creek, Ward St.; storm overflow retention tank and pumping station, Boston University Bridge; relief sewer, Boston Main Drainage Dist. to Ward St.; sewer tunnel 4 mi. Ward St. Station-Brookline to Deer Island; sewer tunnel 7 mi. Columbia Circle to Deer Island; all foregoing in Boston; sewer head work Shaft 2, Chelsea; sewage pumping station and sewer head work, Columbia Circle, foregoing in Dorchester, **$31,500,000,** Charles A. Maguire & Assoc., 294 Washington St., Boston, engrs. CD 1/10.

Mass., Newburyport—City, P. Wks. Dpt., 3 sewerage pumping stations, force main and connecting sewers, $750,000, Whitman & Howard, 89 Broad St., Boston, consult. engrs. CD 4/25/50.

Mo., Poplar Bluff—City, sewerage sys. exten., imprvs. incl. sewage plant, lift stations, sewer extens., etc. $500,000-$1,000,000. Russell & Axon, 408 Olive St., St. Louis 2, Mo., consult. engrs.

▲ **Pa., Duquesne**—City, City Hall, sewage treatment plant, pumping station, sewers, **$1,090,000.** Gannett, Fleming, Corddry & Carpenter, Inc., 600 N. 2nd St., Harrisburg, engr. CD 11/17/50.

Pa., Mt. Pleasant—Mt. Pleasant Boro, sewage disposal plant. **$200,000.** Ralph Wilps, College Ave., Greensburg, engr. CD 2/1/45.

▲ **Tenn., Nashville**—City, City Hall, **$11,000,000** bond election Mar. 20, sewage disposal plant. CD 4/22/48.

BRIDGES

Tenn., Memphis—City, City Hall, 4-lane bridge, 70 tons reinforcing steel, concrete. 60 ft. wide, near Cypress Creek on N. Watkins. **$200,000. Wm. Fowler,** city engr.

STREETS AND ROADS

Ill., Herrin—City, resurfacing, wid'n. Park Ave. with c. conc. curb and gutters. **$232,900.** Charles E. Keen, Carbondale, engr.

Ill., Springfield—City, City Hall, resurfacing and wid'n. 2,794 lin. ft. Monroe St. from 48 to 60 ft. also curbs and gutters. **$260,000.** Chas. A. Nelson, City Hall, city engr. CD 9/2/43.

▲ **NEW YORK**—State Dpt. P. Wks., Albany,

Oneida Co.—6.5 mi. East-West and North-South Arterial Highway in Oneida. **$3,307,900.** CD 11/27/50.

Tex., Galveston—City, Walter Rourke, Jr., Street Comr., City Hall, converting 2 west side streets crossing Broadway into main thoroughfares, $150,000; converting 2 side streets, paralleling Broadway into main thoroughfares, incl. widening, grading, paving, $175,000; widening paving 25 St. Avenue K to Sewall Blvd., $200,000.

Alaska, Ketchikan—City, City Hall, retaining wall, street imprvt., etc. **$405,900.** R. M. Murray, 1638 Interlaken Blvd., Seattle, Wash., consult. engr. L. D. Hubbard, city engr. CD 5/23/50.

EARTHWORK, WATERWAYS

† **New Jersey**—U. S. Eng., 80 Lafayette St., **New York,** N. Y., dredging Newark Bay, Hackensack and Passaic Rivers, **$732,000.**

▲† **New York and New Jersey**—U. S. Eng., 80 Lafayette St., New York, N. Y., dredging in New York and New Jersey Channels. **$1,414,000.**

† **New York**—U.S. Eng., 925 New Federal Bldg., Pittsburgh 19 Pa., flood control in Ohio River Basin at Olean. **$392,000.**

† **New York**—U. S. Eng. 80 Lafayette St., New York, Zone 13, flood control projects at Hoosick Falls. **$206,000.**

▲† **New York**—U. S. Eng., Niagara and Bridge Sts., Buffalo, Zone 7, continuing flood control work at Mount Morris Reservoir, **$5,000,000.** CD 12/29/43.

† **New York**—U. S. Eng., 80 Lafayette St., New York, dredging in New York Harbor, entrance channels and anchorage areas. **$400,000.**

† **New York**—U. S. Eng., Engineer Park, Buffalo, Zone 7, dredging in Buffalo Harbor. **$305,000.**

† **New York**—U. S. Eng., 80 Lafayette St., New York, N. Y. dredging in Hudson River Channel. **$250,000.**

▲ **N. C., Gaston**—Virginia Electric & Power Co., 7 and Franklin Sts., Richmond, Va., hydro-electric power plant and dam on Roanoke River. **$27,000,000.**

Tex., Galveston—City, Walter Rourke, Jr., Street Comr., City Hall, drainage imprvs. **$250,000.**

Tex., Raymondville—Willacy County Water Control & Imprvt. Dist 1, defeated bonds Jan. 8, imprv. irrigation sys., mostly increasing canal capacity. **$500,000.** CD 12/5.

▲ **Alta., Calgary**—City, D. H. McKay, mayor, Civic Bldg., dam at Bearspaw, 10 miles west of city, to prevent winter flooding of Bow River, **$4,000,000.** J. Ivor Strong, city engr.

AIRPORTS

▲† **Calif., Beale Air Force Base**—DORMITORIES, etc.—U. S. Eng., 1209 B St., Sacramento, plans by Blanchard & Maher, 369 Pine St., San Francisco, dormiteries, mess and administration bldg. either 15 masonry, 3 story dormitories, etc. or 23 frame 2 story dormitories, 4 frame mess and administration bldgs., **$3,000,000;** rehabilitation sewage treatment plant, utilities, $2,000,000-$5,000,000 electric power, barracks and messes, $5,000,000-$10,000,000; railroad rehabilitation, $500,000-$1,000,000; steam plant incl. distribution lines for hospital area, **$500,000-$1,000,000;** rehabilitation, housing and mess in hospital area, cold storage, warehouse and contr. warehouse on existing foundation, **$500,000-$1,000,000;** dispatch buildings, issue buildings, pumps and island, Lube racks, wash stands, misc. bldgs., auto shops, heavy equipment shops and paving for storage areas, $2,000,000-$5,000,000 fire station, bakery, administration bldg., base communications bldg., $100,000-$500,000; steam plant incl. distr. lines, $500,000-$1,000,000. headquarters bldg., guard house, warehouse P.X., dispensaries, auditorium-theater, supply headquarters, $1,000,000-$2,000,000; family housing and chapel $100,000-$500,000; rehabilitation of roads, $100,000-$500,000, Beale Air Force Base.

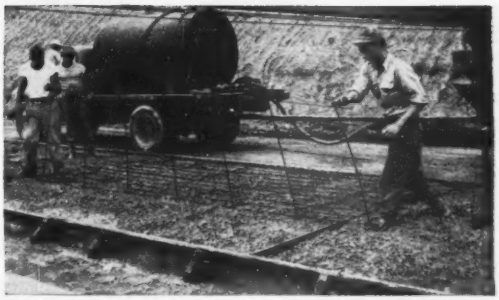
Calif., Long Beach—RUNWAY—City, 205 E. Broadway, runway at municipal airport. **$900,000.** Jess D. Gilkerson, c/o owner, engr. CD 2/14/45.

▲ **Ill., Chicago**—RUNWAY, etc.—City, City Hall, 8,000 ft. runway, $2,000,000; apron at terminal area, $650,000 both at O'Hare Field. Ralph H. Burke, 40 N. Wacker Dr., Zone 6, consult. engr. CD 11/8/45.

▲† **Mass., Chicopee Falls**—AIRPORT FACILITIES—U. S. Eng., 857 Commonwealth Ave., Boston, plans by Dutkill Assoc., Inc., 80 Boylston St., Boston, new runways, taxiways, parking aprons, lighting, Westover Air Force Base, **$6,000,000.** CD 1/4.

▲† **Mo., Grandview**—AIRPORT FACILITIES—U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo., control tower, base operations bldg., crash and fire station, dormitories, 3 dining rooms, headquarters bldg., etc., **$800,000,** addnl. utilities, **$1,500,000,** 50-bed hos-

Left to right: Don MacKay, project manager of S. J. Groves and Sons, Inc.; Walter Jones, resident engineer for Pennsylvania Department of Highways; and E. Miller Smith, job superintendent, discuss the day's operations.



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Road-building caravan moves into one of the new highway's long curves. *At right,* Bethlehem Hinged Bar Mats lie along the finished strip, ready for placing.

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The four-lane Schuylkill Express Highway will provide a fast, direct route between Philadelphia and the Pennsylvania Turnpike's Eastern terminus at King of Prussia. S. J. Groves and Sons, Inc., was the contractor for the 2-mile section extending from West Conshohocken to Gulph Mills. Bethlehem furnished dowel units, bar mats, hook bolts and reinforcing bars.

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(Continued from page 68)

pital $600,000, parking aprons, hangar, etc. $1,500,000, hydrant sys. for aircraft fuel $350,000, 2 warehouses $300,000, BOQ, $700,000, chapel, post exchange, rocket and ammunition storage, parachute storage, etc., total est. $6,000,000, at Grandview Air Force Base, Burns & McDonnell Eng. Co., 95 and Troost Sts., Kansas City, Mo., consult. engrs. CD 11/30.

▲† **Tex., Del Rio**—AIR BASE—U. S. Eng., 606 Santa Fe Bldg., Galveston, plans by Harvin C. Moore, John K. Turney & A. K. Stone, 2006 W. Alabama St., Houston, consult. engrs.-archts., airfield lighting, $75,000; bachelor officers quarters, Approx. $350,000; base communications and telephone exchange, auxiliary field crash station, photo laboratory, academic, administration and base supply administration bldg. units, Approx. $500,000; operations bldg., officers mess, training squadon, headquarters; group headquarters bldg., Approx. $300,000; runway extens., Approx. $350,000; barracks, Approx. $500,000, for Laughlin Air Force Base. CD 7/2.

LATIN AMERICA

▲ **Mexico, Matamoros**—Mexican Federal Govt., Div. P. Wks. & Communications, Mexico City, plans new deep water port. $35,000,000. CD 2/8/50.

PUBLIC BUILDINGS

Calif., Eureka—HOUSING—Eureka Housing Auth., Eureka, plans by Frank T. Georgeson, 537 G St., 38 dwelling unit low-rent housing, north of Harris and east of Prospect Sts. $750,000. CD 4/18.

Conn., Essex—SCHOOL—Town, School Bldg. Comn., 1 story, brick, steel, concrete school, $550,000.

▲ **Conn., Mansfield**—HOSPITAL IMPRVS.—State P. Wks. Comrs., State Office Bldg., Hartford, hospital imprvs., Manfield State Hospital. $1,000,000.

Conn., Norwich—HOUSING—City Housing Auth., 242 Main St., plans by Chandler & Palmer, 16 Franklin St., housing, off Elizabeth St. Extension. $800,000.

▲ **Conn., Southbury**—TRAINING SCHOOL—State P. Wks. Comrs., State Office Bldg., Hartford, patient nursery cottage, $360,000; girls dormitory, $450,000; laundry bldg. addn., $200,000; sewage plant addn., $100,000; power plant imprvs., $90,000, all for Southbury Training School. CD 2/7/49.

Ga., Carrollton—HOUSING—Carrollton Housing Auth., Carrollton, plans by Poundstone, Ayers & Godwin, Bona Allen Bldg., Atlanta, Housing, Projects Ga 116-1 and 116-2, $950,000.

▲ **Ga., Hapeville**—HOUSING—Hapeville Housing Auth., Hapeville, plans by B. E. Robuck, Inc., 1107 W. Rugby Ave., College Park, Ga., 600 housing units, $5,000,000.

Ga., Hogansville—HOUSING—Hogansville Housing Auth., Hogansville, plans by Poundstone, Ayers, & Godwin, Bona Allen Bldg., Atlanta, housing, Projects Ga 135-1 and Ga 135-2, incl. 65 units, $550,000.

Ga., Quitman—HOUSING—Quitman Housing Auth., Quitman, plans by Robert O. Bradley & Co., 110 Radium Springs Rd., Albany, housing, Projects GA 95-1 and GA 85-2, inc., 60 units, $550,000.

Ga., Savannah — HOUSING — Savannah Housing Auth., Realty Bldg., plans by Cletus W. & Wm. P. Bergen, 127 Habersham St., housing Project GA 2-4, Approx. $750,000.

Ga., Thomasville—HOUSING—Thomasville Housing Auth., Thomasville, plans by S. Ralph Fetner, 218 W. Church St., Jacksorville, housing, Project GA-24-3, 90 units, $800,000. CD 5/16/50.

Idaho, Pocatello—LIBRARY—State Bd. Educ., Pocatello, plans by C. A. Sundberg, Idaho Falls, library for Idaho State College, $750,000. Paradise & Hunter, Pocatello, engrs. CD 2/12.

Ia., Shenandoah—SCHOOLS—Bd. Educ., defeated $505,000 bonds, 2 grade schools and remodeling high school. CD 12/5.

Kan., Salina—HOUSING—Federal Housing Admin., Delton Vennett, state dir., National Bank of Topeka Bldg., Topeka, 600 defence housing units, $500,000.

▲ **Ky., Frankfort**—HOME—State, New State Office Bldg., Frankfort, expansion of Kentucky Training Home, incl. 10 cottages, 4 infirmaries, employers residences, addnl. heating, etc. $2,500,000.

La., Donaldsonville—HOUSING—Donaldsonville Housing Auth., c/o Joseph Mistretta, chn., plans by A. Hays Town, Masonic Temple Bldg., Baton Rouge, 125 dwelling units.

La., Eunice—HOSPITAL—City, $434,000 bond election Feb. 27, hospital. CD 10/9/50.

Me., Van Buren—HOUSING—Town, Van Buren Housing Auth., Town Hall, plans by Arnold Perreton, New Hampshire Savings Bank Bldg., Concord, N. H., fifty 1 story, bsmnt. frame housing, Project PHA Maine 1-1, $500,000.

▲ **Mass., Boston**—CIVIC CENTER—City, Mayor's Office, City Hall, plans by Harold Knight, 11 Beacon St., civic center, Boylston, Exeter-Dalton Sts. and Huntington Ave. $35,000,000, Fay, Spofford & Thorndike, 11 Beacon St., consult. engrs.

▲ **Mass., Boston**—HOUSING—Boston Housing Auth., 230 Congress St., (first unit) 1,504 housing units, Calf Pasture, Old Colony Blvd., Dorchester, $17,000,000; (2nd unit) 650 housing units, Calf Pasture, Old Colony Blvd., Dorchester, $7,500,000. CD 12/15/48.

▲ **Mass., Medford**—HOUSING—Medford Housing Auth., City Hall, plans by Carroll H. Tiffany, 50 Beacon St., Boston, one hundred and fifty 1 and 2 story housing units, $1,724,000. CD 11/17/48.

Mass., Pittsfield—SCHOOL—City, Bd. Educ., Dr. E. J. Russell, supt. Schools, City Hall, 2 story, bsmnt., brick high school addn., East St. $750,000. CD 5/19/49.

Mass., Revere—HOUSING—Revere Housing Auth., 23 Pleasant St., plans by William Drummey, engr. and archt., 80 Boylston St., Boston, forty 2 story, bsmnt. housing units, Proj. Mass. 200-2, $500,000. CD 9/28/48.

▲ **Mass., Worcester**—NURSES HOME and CHAPEL—State, Dpt. Mental Health, 15 Ashburton Pl., Boston, plans by M. A. Dyer Co., 24 School St., Boston, hospital and nurses home, M-209, $8,000,000; chapel, gymnasium, $1,500,000, at State Hospital. CD 11/13/45.

Mass., Wrentham—HOSPITAL—State Dpt. Mental Health, 15 Ashburton Pl., Boston, plans by Geo. S. McLaughlin & Assoc., 51 Cornhill, Boston, 4 story, brick, limestone hospital at Wrentham State School, Proj. M-221, $500,000. Wm. H. Krapohl & Assoc., 51 Cornhill, Boston, consult. engrs. CD 2/27/50.

▲ **N. H., Concord**—HIGH SCHOOL—City, H. E. Atherton, supt., Concord, brick, steel concrete high school adjacent to Memorial Field $1,500,000. CD 4/5/46.

N. M., Alamogordo—HOUSING—Alamogordo Housing Auth., c/o H. H. Allen, Temp. Sec., Alamogordo, plans by J. H. Gaylord & Co., 722 N. P. Anderson Bldg., Fort Worth, 300 dwelling units.

N. M., Hobbs—HOUSING—Hobbs Housing Auth., c/o M. L. Barnard, Temp. Sec., Hobbs, plans by J. H. Gaylord & Co., 722 N. P. Anderson Bldg., Fort Worth, Tex., 300 dwelling units.

N. M., Las Cruces—HOUSING—Las Cruces Housing Auth., c/o Kermit Laabs, Temp. Sec. Housing Auth., Las Cruces, plans by J. H. Gaylord & Co., 722 N. P. Anderson Bldg., Fort Worth, Tex., 150 dwelling units.

N. C., Henderson—COURT HOUSE, etc.—Bd. Comrs. Vance Co., Henderson, defeated bonds Jan. 8, court house and jail. $630,000. CD 11/27.

▲ **N. C., Henderson**—SCHOOLS—Bd. Comrs. Vance Co., Henderson voted bonds Jan. 8, schools, $1,355,000. CD 11/27.

▲ **R. I., Newport**—HOUSING—Newport Housing Auth., Wm. J. Donovan, secy., housing, West Broadway Sect. $1,000,000.

▲ **S. C., Columbia** — HOUSING — Columbia Housing Auth., Allen-Benedict Court Office, Columbia, 400 housing units. $3,000,000.

▲ **S. C., Greenville** — HOUSING — Greenville Housing Auth., Perry Ave., 252 housing units. $2,000,000.

▲ **Tex., Beaumont**—WAREHOUSES—Port of Beaumont, c/o Port Comn., Beaumont, voted bonds, rehabilitation and expanding 4 warehouses, $750,000; warehouse and loading docks, $350,000; replacing existing timber aprons and piling with concrete, addnl. port facilities rehabilitation, $400,000.

Tex., Bryan—HOUSING—Bryan Housing Auth., Bryan, plans by Wm. E. Nash, Box 41, Bryan, 90 housing units, $675,000. CD 9/4.

Tex., Dallas — SCHOOLS — Dallas Independent School Dist., Akard and Royal Sts., plans by Mark Lemmon, 1210½ Main St., Casa View School, $450,000; plans by Adams & Adams, 518 W. Davis St., Arcadia Park School addn. $350,000. CD 9/23/49.

Tex., Galveston—HOUSING—Galveston Housing Auth., City Hall, plans by R. R. Rapp, Fred T. Stafford & Thomas N. Price, 417 Guaranty Bldg., 20 two story building, Tex. 17-3, $700,000. Arne G. Engberg, 3810 Fannin St., Houston, assoc. archt. Howard & Johnson, Scanlan Bldg., Houston, consult. engrs. CD 6/29/50.

▲† **Wash., Seattle** — BARRACKS, etc. — Dpt. Army, Pentagon Bldg., Wash. 25, D. C., rehabilitating barracks and warehouses at Fort Lawton, $1,500,000.

Alaska, College — DORMITORY — University of Alaska, College, plans by Foss, Malcolm & Olsen Juneau, 4 story, rein.-con. men's dormitory. $495,750. CD 7/2.

Alaska, Fairbanks—SCHOOL—School Bd., Fairbanks, plans by Alaska Arch. & Eng. Co., Fairbanks, 1 story bsmnt., rein.-con. school. $550,000.

▲ **Alta., Edmonton**—HOUSING—City, City Hall, Edmonton, housing development for 1,900 houses on 300 acres, Approx. $15,000,000. D. B. Menzie, city comr.

N. S. Halifax—SCHOOL—P. J. Mangan, engr. Defence Constr. Ltd., 1032 Gottingen St., plans by Fetherstonbaugh, Dunford, Balton & Chadwick, 901 Victoria Sq., Montreal, Que., 4 story, part bsmnt., 135x200 ft., rein.-con., brick Maritime Warfare School at H.M.C.S. Stadacona Naval Training Station, Approx. $750,000.

▲ **Ont., Brantford**—HOSPITAL—General Hospital Bd., K. V. Bunnell, chn., plans by H. J. Smith, 62 Charles St. E., Toronto, hospital extension, $2,556,000. Neergard, Agnew & Craig, 134 Bloor St. W., Toronto, engrs. CD 12/21/50.

▲ **Ont., Cornwall**—PUBLIC—Dpt. P. Wks., Hunter Bldg., Ottawa, plans by C. G. Brault, ch. archt., c/o owner, 2 story, stone public bldg., to house all Canadian Government office, except Dpt. Transport, $1,000,000. D. A. Freeze, Dpt. P. Wks., 36 Adelaide St. E., Toronto, district archt.

Ont., Toronto—SCHOOLS—Forest Hill Village Bd. Educ., 730 Eglinton Ave. W., plans by Page & Steele, 72 St. Clair Ave. W., 2 story Junior High School, Dunlce Rd., $600,000; West Preparatory School addn., Approx. $300,000.

▲ **Sask., Regina**—CITY HALL—City, City Hall, Regina, city hall, $1,250,000.

(Continued on page 72)

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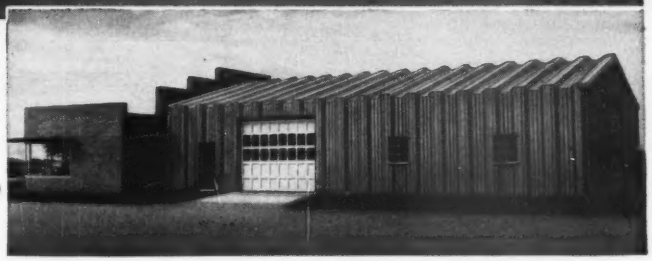

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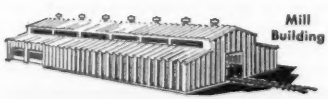

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(Continued from page 70)

COMMERCIAL BUILDINGS

▲ **Conn., West Hartford**—APARTMENT—Steward A. Burkland, West Haven, 9 bldgs., stone, masonry garden-type apartment, south end of Hillcrest and Abbottsford Aves., $2,000,000-$3,000,000.

▲ **Fla., Coral Gables**—HOTEL—Bowman Ashe Hotel, c/o B. Robert Swartburg, 126 24 St., Miami Beach, hotel. $1,000,000.

▲ **Fla., Coral Gables**—ADMINISTRATION—University of Miami, Coral Gables, plans by Robert Law Weed & Assocs., Dupont Bldg., Miami, 7 story Ashe Administration Bldg. $1,000,000. CD 1/20/49.

Ga., Augusta—ADMINISTRATION—Medical College of Georgia, c/o Scroggs & Ewing, archts., Greene St., administration bldg. $600,000. CD 4/20.

▲ **Ill., Maywood**—HOSPITAL, etc.—Baptist Home Hospital, 315 Pine St., plans by E. E. Roberts & Elmer C. Roberts, Inc., 201 N. Wells St., Chicago, hospital and rest home, $2,500,000.

Ind., Terre Haute—HOSPITAL—St. Anthony's Hospital, Poor Sisters of St. Francis, 1021 S. 6 St., plans by Ralph Yaeger, 402 Opera House Bldg., 1 and 2 story, 54x139 ft., and 62x102 ft., brick, stone, rein.-con. hospital addn. and remodeling, $700,000.

▲ **Mich., Dearborn**—COMMUNITY CENTER—Ford Foundation, 2612 Buhl Bldg., Detroit, and Ford Motor Co., 856 Penobscot Bldg., Detroit, plans by Skidmore, Owings & Merrill, 100 W. Monroe St., Chicago 3, Ill., develop 4,500 acres farm land into community with homes, apartments and schools. $200,000,000.

Mo., Kansas City—SEMINARY, etc.—Church of the Nazarene, c/o Dr. Hugh C. Benner, pres., 2940 Troost St., Zone 3, seminary and headquarters bldgs., Meyer Blvd. and Paseo St. $500,000.

N. Y., Brooklyn—HOME for AGED—Warschauer Hayn Salomon Home for The Aged, Inc., 43 St. Marks Pl., New York, plans by George W. Swiller, 535 E. Tremont Ave., New York, Zone 57, 1 story home for the aged, 2282-231e Cropsey Ave. $950,000. CD 5/6/49.

▲ **N. Y., New York**—APARTMENT—Sam Minskoff & Sons, 521 Fifth Ave., Zone 17, apartment, 5 Ave., between 8 and 9 Sts. $3,000,000.

▲ **Pa., Berwyn**—RESIDENCES, etc.—Owner, c/o Walter K. Durham, archt., 1606 Latimer St., Phila., 80 residences and shopping center. Approx. $1,250,000.

Tex., Farmers Branch—SHOPPING CENTER—A. Webb Roberts & Assoc., c/o Athletic Club Bldg., Dallas, shopping center, 30-acre tract in 350-acre industrial tract. $750,000.

▲ **Tex., Houston**—LIBRARY—Houston Academy of Medicine, 1200 M. D. Anderson Bldg., plans by Cameron Fairchild, 2626 Westheimer St., medical library (for Texas Medical Center). $1,200,000. CD 3/16/49.

▲ **Tex., Houston**—DOCTORS—Memorial Hospital, 602 Lamar St., plans by Kenneth Franzheim, 2402 Crawford St., 6 story doctors bldg., between Lamar and McKinney Sts. $1,000,000.

▲ **Tex., Houston**—BANK and OFFICE—South Main State Bank, 3001 Main St., plans by Kenneth Franzheim, 2402 Crawford St., 10 story bank and office, S. Main St. $2,000,000.

▲ **Tex., Longview**—BANK and OFFICE—First National Bank Bldg., c/o C. A. Loftin, pres., Longview, plans by Alfred C. Finn, Bankers Mortgage Bldg., Houston, 16 story bank and office. $2,000,000. CD 3/30/50.

▲ **Wash., Seattle**—HOSPITAL—Dr. T. W. Buschmann, et al, Stimson Bldg., Zone 1, plans by M. Rich, 5128 E. 54 St., hospital, Minor Ave. and Spring St. $1,000,000.

▲ **Wash., Seattle**—HOSPITAL—North End Hospital Assn., c/o Dr. R. E. Nelson, 900 E. 63 St., plans by Naramore, Bain, Brady & Johanson, 904 7 Ave., hospital. $2,428,000.

INDUSTRIAL BUILDINGS

▲ **Del., Wilmington**—PLANT—The Pyrites Co., Inc., foot of Christian Ave., ore handling plant addn. $1,395,000.

▲ **Ia., Mason City**—PLANT—North Iowa Co-operative Processing Assn., Glenn Pogeler, manager, Manly, plans by R. W. Booker & Assocs., 1722 Olive St., St. Louis, 3, Mo., several bldg., steel, masonry transite construction, concrete work, etc. for soybean processing plant. $1,500,000. CD 12/20.

Mo., Carthage—MINE—American Zinc, Lead & Smelting Co., Paul Brown Bldg., 818 Olive St., St. Louis, Zone 1, expansion program at Quick Seven Mine incl. concentrating mill daily capacity of 1,000 tons ore, etc., Jasper Co., near Neck City, $700,000.

N. C., Spruce Pine—PLANT—United Fieldspar & Minerals Corp., rebuild plant. $500,000.

▲ **Tex., Corpus Christi**—GASOLINE REFINERY—Pontiac Refining Corp., 3400 Lawrence St., aviation gasoline refinery unit. $2,000,000. CD 1/23/50.

▲ **Tex., Gainesville**—GENERATING PLANT, etc.—Texas Power & Light Co., Interurban Bldg., Dallas, 80,000 kw. electric generating plant at River Crest, $5,500,000; 5,000 kw. electric generating plant unit, $375,000.

▲ **Tex., Orange**—PLANTS—Solvey Process Div. of Allied Chemical & Dye Corp., 61 Broadway, New York, N. Y. addnl. chemical plant units for mfg. various chemicals, Approx. $10,000,000; chemical plant to mfg. ethylene glycol and ethylene oxide, Approx. $8,000,000, on 650 acre tract, near here.

▲ **Tex., Waco**—GENERATING PLANT—Texas Power & Light Co., Interurban Bldg., Dallas, 80,000 kw. electric generating plant, $4,500,000.

▲ **W. Va., Moundsville**—PLANT—Allied Chemical & Dye Corp. 61 Broadway, New York, N. Y., chemical plant on 400-acre site at Round Bottom Bend on Ohio River, 2 mi. south of here, $15,000,000.

▲ **B. C., Vancouver**—WOOD PULP and NEWS PRINT DEVELOPMENT—Celgar Development Co., c/o Celanese Corp. of America, 180 Madison Ave., New York, N. Y., U. S. A., wood pulp and newsprint development in Arrow Lakes area of southeastern B. C., near Castlegar. $65,000,000.

UNCLASSIFIED

Colorado—DISTRIBUTION LINES—Mountain View Electric Assn., Limon, 135 mi. new distr. lines and rehabilitation of lines, Lincoln Co. $465,000. C. B. Eng. Co., 25 S. Grove St., Denver, consult. engr. CD 9/28/50.

Massachusetts—SWIMMING POOL—State, Metropolitan Dist. Comm., Parks Div., 20 Somerset St., Boston, swimming pool and recreation area, Pine Banks Park area, Malden and Melrose, $350,000.

▲ **Mass., Boston**—TUNNEL, etc.—State Metropolitan Transit Auth., 31 St. James Ave., tunnel Park St. to Scholly Square and enlarging Park St. subway station, $13,000,000, Maguire Assoc., 294 Washington St., consult. engrs. CD 3/25/48.

▲ **Mass., Boston**—TUNNEL—State Metropolitan Transit Auth., 31 St. James Ave., Boston, Sects. 1 and 3, Washington St. Tunnel exten. Essex St. to Dudley St. and Dudley St. to Forest Hills Terminus, $30,000,000, Maguire Assoc., 294 Washington St., engrs. CD 9/5.

Mass., Boston—RECEPTION CENTER—State Youth Service Bd., 14 Somerset St., plans by Abbott Assoc., 131 State St., reception center addn., $757,000. CD 1/25/51.

Mich., Escanaba—DOCKS—City, George Harvey Jr., clk., maintenance work on iron ore docks. $300,000.

S. C., Newberry—GAS SYSTEM—City, natural gas sys. $710,000. J. W. Goodwin Eng. Co., 2111 7th Ave. South, Birmingham, Ala., consult. engr.

Tennessee—RURAL DISTRIBUTION LINES—Pickwick Electric Membership Corp., Selmer, 50 mi. rural distr. lines and other sys. imprvs., in Selmer, McNairy Co. $325,000. Allen & Hoshall, 65 McCall Pl., Memphis, Tenn., consult. engrs. CD 12/1/48.

▲ **Alaska, Ketchikan**—POWER SYSTEM—City, City Hall, extend power sys. by expansion of Beaver Falls Dam. $1,616,190. W. A. Shannon, Skinner Bldg., Seattle 1, Wash., consult. engr. CD 10/30.

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CONSTRUCTION REPORTS-Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
February 5 Massachusetts February 6 Connecticut

BIDS ASKED—BUILDINGS

Mass, Boston—SCHOOL—B.A. 2/27—City, School Dpt., 26 Norman St., Fairmount Elementary School, Williams Ave. and Summit St., Hyde Park, $650,000. Plans deposit $100, Thomas F. McDonough, 25 Huntington Ave., archt. CD 12/8/50.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **T. W. Cunningham, Inc.,** 38 Columbia St., Bangor, Me. CA $140,000, rehabilitate, alterations, addnl. buildings, 52-NED-6Q, PRESQUE ISLE, ME. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. Eaton W. Tarbell & Assoc., 84 Harlow St., Bangor, Me., archts. CD 12/28.

▲ **City,** Municipal Bldg., 550 Main St., Hartford, Conn., rejected bids Dec. 20, refuse incinerator Contr. E 51-189 HARTFORD, CONN. LB $1,788,507. Will re-advertise. CD 12/31, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

Geo. A. Fuller Co., 11 Beacon St., Boston, Mass. CA $500,000. altering OFFICE, Memorial Dr., CAMBRIDGE, MASS. Massachusetts Institute of Technology, 77 Massachusetts Ave., Cambridge, Mass CD 9/5.

White Constr. Co., 134 Newbury St., Boston, Mass. CA $827,800. PHA 16-2 HOUSING, Clinton St. and Crescent Ave., CHELSEA, MASS. Chelsea Housing Auth., City Hall, Chelsea, Mass. CD 1/14 under LB.

Henry Gironi, 18 Ridge St., Arlington, Mass. Separate Contracts. $300,000, 50 ranch type HOUSES on Rte. 2, LEXINGTON, MASS. CD 11/15.

Louis Marion & Son, 12 Martin St., Lowell, Mass. CA $524,000. HOSPITAL renovation, alteration, LOWELL, MASS. St. John's Hospital, Bartlett St., Lowell, Mass. CD 1/11.

Paul Livoli, 922 Belmont St., Watertown, Mass. Owner Builds. $400,000, 40 brick, stone HOMES, WINCHESTER, MASS. Christopher C. Crowell, 120a Atwood Ave., Newton, Mass., archt.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
February 14 New Jersey February 21 Pennsylvania
STREETS AND ROADS
February 5 Maryland February 21 Pennsylvania

Md., Towson—B.A. 2/7—Comrs. Baltimore Co., Court House, Contr. 253 D, 2,410 lin. ft. 18- to 60-in. R.C.C.P., rein.-con. box culvert, inlets, etc. Plans deposit $5, Chas. B. Wheeler, Court House, ch. engr. CD 1/26/44.

BIDS ASKED—BUILDINGS

▲ **Md., Crownsville**—ADMISSION—B.A. 2/7—State, Dpt. Imprvts., 506 Park Ave., Baltimore, Zone 1, 1 story, 300x600 ft., brick, cinder block Crownsville Admission Bldg., $1,700,000. Plans deposit $40. Jas. R. Edmunds, Jr., 130 W. Hamilton St., Baltimore, archt. J. L. Faisang & Assoc., 21 W. 25 St., Baltimore, struct. engrs. Jas. Posey & Assoc., 10 E. Pleasant St., Baltimore, mech. engrs. CD 10/17.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Washington Suburban Sanitary Comn.,** 4017 Hamilton St., Hyattsville, Md. rejected bids Dec. 7, Rocky Gorge Dam and Pumping Station, piers and bridge, on Patuxent River near Laurel, HYATTSVILLE, MD. LB $2,994,600. CD 12/11, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

Gerace & Castagna, Inc., 1711 Sheepshead Bay Rd., Brooklyn 29, N. Y., CA. $739,594, OUT PATIENT Bldg., Cumberland Hospital, BROOKLYN, N. Y. Dpt. P. Wks., Municipal Bldg., New York 7, N. Y. Bids Nov. 28, awarded Jan. 10. CD 12/7, under LB.

▲ **Burlington Manor Housing Corp.,** W. 5 St., Burlington, N. J., Separate Contracts, $1,460,000, RESIDENTIAL DEVELOPMENT, W. 5 St., BURLINGTON, N. J. Edward A. L. Cox, 709 Market St., Camden, N. J., archt.

Macasons Builders, Box 21, Bristol, Pa., CA. $600,000. RESIDENTIAL DEVELOPMENT, Bath Rd., BRISTOL, PA. Margo Homes, Inc., Bath Rd., Bristol, Pa.

▲ **Alex H. Alessi,** 103 W. Lancaster Ave., Wayne, Pa., Separate Contracts. Approx. $1,000,000. RESIDENTIAL DEVELOPMENT, near Brandywine Village, KING OF PRUSSIA, PA.

▲ **J. S. Mozino & Co., Inc.,** 423 Burmont Rd., Drexel Hill, Pa., Separate Contracts. Approx. $2,650,000. RESIDENTIAL DEVELOPMENT, near Providence Rd., MORTON, PA.

† **Malan Plumbing Co., Inc.,** 25 42nd St., Long Island City, N. Y., LB $718,200, 7 STORAGE SHEDS and necessary work, NEW CUMBERLAND, PA. Dpt. Army, 24 St. and Maryland Ave., Baltimore, Md. Bids Jan. 15. CD 1/10.

▲ **Henry Berman,** 6032 Market St., Phila., Separate Contracts. Approx. $2,424,000. RESIDENTIAL DEVELOPMENT I, J, K and L Sts., PHILA., PA. J. Ethan Fieldstein, 1325 Walnut St., Phila., Pa., archt.

▲ **Nolen Constr. Co.,** E. Washington Lane, Phila., Pa., Separate Contracts. Approx. $2,000,000. RESIDENTIAL DEVELOPMENT, Woodland Ave., etc. ROSLYN, PA.

▲ **Consolidated Engineering Co., Inc.,** 20 E. Franklin St., Baltimore, Md., CA. Approx. $3,000,000. design and construct PLANT in Springettsbury Twp. YORK, PA. Caterpillar Tractor Co., T. R. Farley, vice pres., 600 W. Washington St., East Peoria, Ill. Whitman, Requardt & Assoc., 1304 St. Paul St., Baltimore, Md., engrs. CD 12/4.

Malatesta, Inc., 1044 N. du Pont St., Wilmington, Del., Separate Contracts, $650,000, RESIDENTIAL DEVELOPMENT, Basin Rd., NEW CASTLE, DEL.

Turner Constr. Co., 1500 Walnut St., Phila., Pa., LB, $510,800. Dr. Charles R. Drew Elementary SCHOOL, WILMINGTON, DEL. Bd. Educ., 11 and Wallaston Sts., Wilmington, Del. Bids Jan. 16. CD 1/2.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

† **Fla., Tampa**—BUILDINGS—B.A. 2/8—Base Contg. Office, MacDill Air Force Base, Tampa, rehabilitation of celestial navigation training bldgs., Inv. 52-19. CD 2/20/50.

† **Louisiana**—B.A. 2/20—U. S. Eng., foot of Prytania St., New Orleans, Zone 9, dredging 715,000 cu. yd. materials from turning basin in Calcasieu River and Pass, Cameron Parish. CD 6/26/46.

▲† **Fla., Eglin Air Force Base**—B.A. After 5/1—U. S. Eng., P. O. Box 1169, Mobile, 7, Ala., runways, aprons, and misc. bldgs. $5,000,000. CD 2/20/50.

▲† **Miss., Biloxi**—WAREHOUSES, etc.—B.A. After 5/1—U. S. Eng., P. O. Box 1169, 2301 Grant St., Mobile 7, Ala., warehouses, sewage treatment facilities, cold storage facilities, dental clinics, etc, Keesler Air Force Base. $3,000,000. CD 2/7/51.

BIDS ASKED—BUILDINGS

Ga., Buford—HOUSING—B.A. 2/14—Buford Housing Auth., Buford, 70 units housing, Projects GA 91-1 and GA 91-2. $550,000. Plans deposit $25. Norman F. Stambaugh, Rhodes Bldg., Atlanta, archt. CD 11/21, under LB.

▲ **S. C., Columbia**—HOUSING—B.A. 2/21—Columbia Housing Auth., Allen-Benedict Court Office, Proj. SC 2-4, 400 unit housing. $3,000,000. Plans deposit $50. James B. Urquhart, Palmetto Bldg., archt. CD 1/17.

Tenn., Clinton—HOUSING—B.A. 2/26—Clinton Housing Auth., Clinton, 122 housing units. $800,000. Plans deposit $50.

▲ **S.C., Greenville**—HOUSING—B.A. 2/27—Greenville Housing Auth., Perry Ave., Proj. SC 4-2, 252 unit housing. $2,000,000. The McPherson Co., 408 S. Main St., archt. CD 1/17.

▲ **Ala., Anniston**—HOUSING—B.A. About 3/1—Anniston Housing Auth., Anniston, 272 housing units, $2,000,000. Extended date. Richard Boinest, 1021 Montvue Ave., archt. CD 8/17.

▲† **Ala., Huntsville**—ARSENAL IMPRVS.—B.A. After 4/1—U. S. Eng., P. O. Box 1160, Mobile, Zone 7, guided missile facilities, $3,500,000; shop, $1,500,000, both at Redstone Arsenal. CD 11/30.

▲† **Ala., Anniston**—IGLOOS, etc.—B.A. After 5/1—U. S. Eng., P. O. Box 1169, Mobile, Zone 7, igloos, etc. at Anniston Ordnance Works, $5,000,000. CD 9/28.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

WEST VIRGINIA—State Hy. Comn., Charleston.
Keeley Constr. Co., Clarksburg, W. Va., LB, $418,865, road mix surf. 9.669 mi. Fenwick-Craigsville Rd., S-612 (1), Nicholas Co.;
J. F. Allen Co., Clarksburg, W. Va., LB, $309,058, traffic bound base 5.524 mi. Joetown-Curtisville Rd., S-607 (1), Marion Co. Bids Jan. 8. CD 12/28.

SOUTH CAROLINA—State Hy. Dpt., Columbia,
McMeekin Constr. Co., Cheraw, S. C., CA. $621,287, widening, reconstructing with rein. conc. and structural steel 4,777 ft. approach bridges with 0.132 mi. earth graded and bit. surf. detour roads, 2 untreated timber detour bridges at Savannah River, U. S. Rt. 17, FI-2577 (1), Jasper Co. S. C., and Chatham Co., GA.

Joseph W. Barnwell, Jr., Columbus, S. C., CA. $247,550, 687 ft. rein.-con., structural steel bridge over Atlantic Coast Line & Southern R.R. tracks on Blossom St., in Columbia, UG-2570 (3), Richard Co. Bids Jan. 15. CD 1/8.

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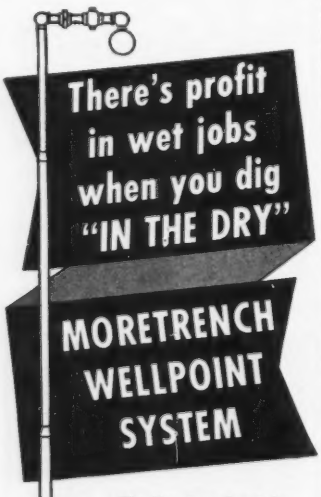

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▲ **SOUTH CAROLINA**—State Hy. Dpt., Columbia, **Wham Constr Co.,** Anderson, S. C., CA. **$113,990,** blt. surf. 8.295 mi. Roads 77, 76 and 72 from Rt. 28 southerly and westerly across Rt. 284 to Secession Lake and 2,408 mi. on Roads 71 and 55 from Rt. 81 southeast of Lowndesville northeasterly to Rt. 71, S-614 (1) and S-346 (2), Abbeville Co.;

Bituminous Constr. Co., Whitmire, S. C., CA. **$598,756,** wid'n., b. conc. surf. 10.959 mi. Rt. 19 from Rt. 781 northerly to Aiken, AA-5, Aiken Co.;

W. M. Reagan & Sons, Sumter Hy., Columbia, S. C., CA. **$180,371,** bit. surf. 9.565 mi. Road 135 from Rt. 27 northeast to intersection of Rts. 6 and 311; 5.28 mi. Roads 175, 104 and 174 from U. S. 176 north to Rt. 453; 0.448 mi. Roads 182 and 227 in and near Holly Hill and 0.463 mi. Road 222 in Eutawville, S-227 (4) and S-634 (1), Berkeley and Orangeburg Counties; CA. **$79,995,** bit. surf. 5.042 mi. Road 83 from Rt. 19 at Silverstreet southeast to Rt. 395 and 3.153 mi. Road 101 from Rt. 22 near Silverstreet northwest to Road 48, S-632 (1) and S-631 (1), Newberry Co.;

Hubbard Constr. Co., Marion, S. C., CA. **$279,960,** blt. surf. 4.36 mi. Road 20 from Road 22 at Teals Mill to U. S. 1; 5.902 mi. Road 46 from U. S. Rt. 1 south to Darlington Co. line; 4.383 mi. Road 29 from U. S. Rt. 1 north to Road 167; 3.427 mi. Road 114 from Darlington Co. line northwest to Road 114; 4.759 mi. Road 79 from Rt. 102 east to Road 20 at Teals Mill; 2.926 mi. Road 149 from Rt. 102 west to Road 81 and 1.824 mi. Road 168 from Rt. 9 south to Road 22, S-594 (1), Pt 2, S-595 (1), S-39 (2), S-597 (1) and S-594 (1), Pt. 1, Chesterfield Co.;

Boyle Constr. Co., Sumter, S. C., CA. **$157,346,** blt. surf. 2.978 mi. Road 21 from Rt. 430 south to Road 59; 3.013 mi. Rd. 113 from Rte. 43 south to Road 61; 2.267 mi. Road 72 from Rt. 23 southeast to Rt. 19 and 3.978 mi. Road 34 from end of pavement south of Ropers Cross Roads north to beginning of pavement S-350 (2), Edgefield Co.;

Fox Constr. Co., Lexington, S. C., CA. **$152,637,** blt. surf. 2.904 mi. Roads 91 and 89 from Rt. 601 northeast to the Chester Co. line; 2.08 mi. Road 52 from Road 89 southeast to Rt. 22 near Mitford; 1.421 mi. Road 55 from Rt. 22 at Mitford northwest to Chester Co. line, 6.808 mi. Road 41 from Rt. 22 easterly to U. S. Rt. 21, S-406 (4), Pts 1 and 2, S-582 (1), S-563 (1) and S-598 (1), Fairfield Co.;

Spotts & Co., Newberry, S. C., CA. **$95,926,** blt. surf. 1.076 mi. Road 40 from Rt. 215 at Buffalo southwest to Rt. 215; 0.612 mi. Road 41 from Rt. 215 near Buffalo Road 75; 4.039 mi. Road 30 from Rt. 9 south to Road 4 and 1.782 mi. Road 71 north to Road 43, 44,264, etc. Union Co. Grand total $1,658,981. Bids Jan. 15. CD 1/8.

† **McKoy-Helgerson Co.,** P. O. Box 25, Greenville, S. C. CA. **$756,108.** Airmen's dormitories, mess-administration bldgs., Inv. 52-10, at Donaldson Air Force Base, GREENVILLE, S. C. U. S. Eng., 33 Customhouse, Charleston 1, S. C. Bids Jan. 14. CD 1/21, under LB.

▲† **Perini, Walsh Mills and Blythe Bros. Co.,** Box 308, Chattahoochee, Fla., CA, **$13,907,380,** constr. gated spillway powerhouse and switchboard housing at Jim Woodruff Dam, Chattahoochee, FLORIDA. U. S. Eng. P.O. Box 1169, Mobile, 7, Ala. Bids Jan. 16, awarded Jan. 17. CD 1/22, under LB.

† **Greenhut Constr. Co.,** Box 1175, Pensacola, Fla., CA **$844,444,** heavy systems bldg., Inv. 52-38, EGLIN FIELD, FLA. U. S. Eng., P. O. Box 1169, Mobile 7, Ala. Bids Jan. 15. CD 122, under LB.

▲† **Perini-Walsh-Mills & Blythe Bros.,** Box 308, Chattahoochee, Fla., LB **$13,901,379,** gated spillway, power house and switchyard at Jim Woodruff Dam on Apalachicola River, FLORIDA. U. S. Eng., P. O. Box 1169, Mobile 7, Ala. Bids Jan. 16. CD 1/8.

† **Greenhut Constr. Co.,** 23 South "A" St., Pensacola, Fla., LB **$844,444,** heavy system bldg., Inv. 52-38, Eglin Air Force Base, EGLIN FIELD, FLA. U. S. Eng., P. O. Box 1179, Mobile, Ala. Bids Jan. 15. CD 1/3.

▲ **Nichols Eng. & Constr. Co.,** 70 Pine St., New York, N. Y. CA. **$2,898,000.** refuse incineration plant, MIAMI, FLA. City, City Hall, Miami, Fla. Bids Dec. 19. CD 12/31, under LB.

† **R. P. Farnsworth & Co., Inc.,** 1515 S. Salcedo St., New Orleans, La. CA **$459,168.** Dumaine St. floodwall, Inv. 52-131, LOUISIANA. U. S. Eng. foot of Prytania St., New Orleans 9, La. Bids Jan. 15. CD 12/18.

† **Fordice Constr. Co.,** Porter Bldg., Memphis, Tenn. CA **$766,400.** 80,000 squares articulated concrete mattress, Delta Co.;

Warren Bros. Roads Co., First National Bank Bldg., Birmingham, Ala. CA **$600,600.** 70,000 squares articulated concrete mattress, Vidalia Co., LOUISIANA. U. S. Eng., foot of Prytania St., New Orleans 9, La. CD 12/13, under LB.

† **Latex Constr. Co. of Georgia,** 4911 Old Peachtree Rd., Atlanta, Ga. LB **$546,488,** est. $643,842. aircraft refueling sys., incl. 18 underground storage tanks, 6 aircraft refueling outlets, oil storage tanks, Eng. 15-029-52-38, FORT CAMPBELL, KY. U. S. Eng., 830 W. Broadway, Louisville, Ky. Bids Jan. 16. CD 12/11.

▲† **Dravo Corp.,** Dravo Bldg., Pittsburgh, Pa., CA **$3,086,414,** construct 1,000 ft. Cheatham Dam, 80 ft. wide on Cumberland River near Ashland City, CIVENG 40-058-52-19, TENNESSEE. U. S. Eng., 303 U. S. Court House, Nashville, Tenn. Bids Jan. 17. CD 1/24, under LB.

HEAVY CONSTRUCTION
LOW BIDS AND CONTRACTS

James E. Green, Johnson City, Tenn., LB **$1,283,000.** HOUSING units, BRISTOL, VA. Bristol Redevelopment & Housing Auth., Bristol, Va. Bids Jan. 15. CD 1/11.

Thorington Constr. Co., 205 E. Canal St., Richmond, Va., LB **$630,000.** SCHOOLS at Newbern, Hiwassie, Snowville and Draper, PULASKI, VA. Pulaski Co., Pulaski, Va. CD 6/2/50.

Barge-Thompson Co., 136 Ellis St. N. E., Atlanta, Ga., CA. Approx. $350,000. dial and toll OFFICE addns., GASTONIA, N.C. Southern Bell Telephone Co., Hurt Bldg., Atlanta, Ga.

Arthur L. Shelton, Thomasville, N. C. CA. Approx. $300,000. HOTEL, THOMASVILLE, N.C. Robert C. Rapp, Jr., Thomasville, N. C.

Spong Constr Co., 608½ Harden St., Columbia, S. C. CA. $572,650, HIGH SCHOOL, BATH, S.C. Aiken Co. School Dist., 4, Aiken, S. C. Bids Jan. 10. CD 1/17 under LB.

Battery Park Co., Beaufort, S. C. Owner builds. Approx. $500,000. 62 HOUSING units, BEAUFORT, S.C.

Mid-State Const & Supply Co., c/o B. J. Barnett, Bishopville, S. C. Owner Builds. Approx. $550,000. 70 RESIDENCES, BISHOPVILLE, S. C.

Daniel Const Co., 429 N. Main St., Greenville, S. C. CA. $766,000. HIGH SCHOOL, PELZER, S. C. School Dist. 20, Anderson, S. C. Bids Jan. 8. CD 1/15 under LB.

▲ † **Grannis & Sloan, Thompson & Street and R. H. Wattinger,** Pineville Rd., Charlotte, N. C., CA, **$10,388,000.** WAREHOUSES at Marine Depot, NOY 70659, ALBANY, GA. Dist. P. Wks. Office, Box 365 Naval Base, S. C. Bids Jan. 10 CD 1/15, under LB.

Clayton Boardman, Jr., 1316& Comfort Rd., Augusta, Ga., Owner Builds. Approx. $550,000. 73 HOUSING units, AUGUSTA, GA.

▲ **Knox Corp.,** Thomson, Ga., Owner Builds. Approx. $1,500,000. 200 HOUSING units, AUGUSTA, GA.

▲ **Marion Corp.,** Augusta, Ga. Owner Builds. Approx. $1,500,000. 200 HOUSING units, AUGUSTA, GA.

Walker Villa, Inc., Augusta, Ga. Owner Builds. Approx. $750,000. 100 HOUSING units, AUGUSTA, GA.

Whitehead, Mill & Bazzle Co., Augusta, Ga. Owner builds. Aprox. $600,000. 79 HOUSING units, AUGUSTA, GA.

Thomas Woods Corp., c/o Blanchard & Calhoun, 771 Broad St., Augusta, Ga. Owner Builds. Approx. $950,000. 123 HOUSING units, AUGUSTA, GA.

Eubanks Home Builders, Inc., Marietta, Ga., Owner Builds. Approx. $900,000. 116 HOUSING units, MARIETTA, GA.

Hugh Oliver, Inc., Marietta, Ga., Owner Builds. Approx. $700,000. 92 HOUSING units, MARIETTA, GA.

A. P. Welker, 208 Roswell St., Marietta, Ga., Owner Builds. Approx. $850,000. 107 HOUSING units, MARIETTA, GA.

Jack Culpepper, 114 E. 5 Ave., Tallahassee, Fla., LB $849,000. 125 units HOUSING, Projects GA *0-3 and GA 60-4, MOULTRIE, GA. Moultrie Housing Auth., Moultrie, Ga. Bids Jan. 16. CD 1/3.

W. A. Ward, Jr., College Park, Ga., Owner Builds. Approx. $900,000. 116 HOUSING units, SMYRNA, GA.

Knox Georgia Homes, Neal Rd., Thomson, Ga., Owner Builds Approx. $600,000. 80 HOUSING units, VALDOSTA, GA.

▲ **D D D Constr. Co.,** c/o Melbourne Properties, Melbourne, Fla. Owner Builds, Approx. $1,200,000. 155 HOUSING UNITS, MELBOURNE, FLA.

▲ **Mayben & Sons Constr. Co.,** Gadsden, Ala., LB $1,411,600. WAREHOUSE, GADSDEN, ALA. Goodyear Tire & Rubber Co., Gadsden, Ala. Bids Jan. 15. CD 1/8.

D. S. McClanahan & Son, Columbus, Miss. CA $515,124. High SCHOOL for Whites. COLUMBUS, MISS. Columbus Municipal Separate School Dist., Columbus, Miss. CD 1/22, under LB.

▲ **Ray M. Lee Co.,** 1004 Edgewood Ave., Atlanta, Ga. LB $1,387,982. 130 bed HOSPITAL, JACKSON, MISS. St. Dominic's Hospital, c/o James T. Canizaro, archt., Deposit Guaranty Bank Bldg., Jackson, Miss. Bids Jan. 17. CD 12/27.

▲ **Keller Constr. Co.,** 7900 Palm St., New Orleans, La. LB $735,000. Item A, foundations, dumper pits, etc.;

MacDonald Engineering Co., 188 W. Randolph St., Chicago, Ill. LB $5,625,000. Item B, GRAIN ELEVATOR structures, appurtenance complete with mechanical, electrical and all other installations;

Fegles Constr. Co., 711 Wesley Temple Bldg., Minneapolis, Minn., LB $6,568,000. entire GRAIN ELEVATOR Proj., NEW ORLEANS, LA. Port of New Orleans, 2 Canal St., New Orleans, La. Bids Jan. 18. CD 12/11.

▲ **Port City Constr. Co.,** P. O. Box 22, Lake Charles, La. CA Total $3,000,000. REFINERY No. 3 addn., WESTLAKE, LA. Continental Oil Co., Westlake, La. CD 1/8.

Horowitz & Gabar, Falls Church, Va. LB $575,616. 65 HOUSING units at Blue Grass Ordnance Depot, RICHMOND, KY. U. S. Eng., P. O. Box 59, Louisville, Ky. Bids Jan. 15. CD 12/13.

▲ **Wherry Apartments, Inc. & Midwest Mortgage Co.,** 2545 S. 3rd St., Louisville, Ky. Owner Builds. Approx. $3,000,000. 400 HOUSING units, CLARKSVILLE, TENN.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
February 5 Ohio
STREETS AND ROADS
February 5 Ohio — February 6 Michigan

BIDS ASKED—BUILDINGS

† **Ind., Kingsbury**—BUILDINGS—B.A. 2/5—U.S. Eng., 520 Merchandise Mart, Chicago 54, Ill. 2 blending buildings and related facilities, superstructures 43x43 ft. with connecting interior utilities, ramp 225 ft. long. CD 1/9, under LB.

▲ **Mich., Monroe**—SCHOOL—B.A. 2/5—City, Bd. Educ., N. S. Thompson, secy., 295x340 ft. Junior High School, $1,100,000. Plans deposit $35. Warren S. Holmes Co., 2200 Olds Tower, Lansing, archt. CD 7/19.

▲ **Ill., Riverside**—SCHOOL — B.A. 2/11 — Riverside Brookfield High School, Riverside, 2 story, 208x218 ft., brick, concrete steel school addn., $1,200,000. Schmidt, Garden & Erikson, 104 S. Michigan Ave., Chicago, archts. CD 11/1.

▲ **Ind., Gary**—HOUSING—B.A. 2/11—Gary Housing Auth., 400 Progress St., Dorie Miller Community Housing. $2,000,000. Beine, Hall & Curran, 607 Broadway, archts. CD 8/15.

Mich., Marshall—HOSPITAL—B.A. 2/14—Borgess Hospital Assn., Marshall, 2 story, bsmnt., brick, steel Oaklawn Hospital. $700,000. Plans deposit $20. Lewis J. Sarnia, 258 Champion St., Battle Creek, archt.

▲ **Wis., Verona**—HOME AND HOSPITAL—B.A. 2/14—Dane Co., Madison, two 45x185 ft., three 1 story, 43x320 ft. wings, 1 story, bsmnt., 65x114 ft. county home and hospital, $2,000,000. Plans deposit $50. Law, Law, Potter & Nystrom, 121 S. Pinckney St., Madison, archts. CD 9/5.

▲ **Ill., Chicago**—DENTISTRY, etc.—B.A. 2/19—University of Illinois, 1716 W. Taylor St., 6 story, steel, wood piling dentistry-medical-pharmacy bldg. $3,000,000. Pace Associates, 53 W. Jackson St., Zone 4, archts. CD 11/9, under LB.

▲ **Ill., Chicago**—HOUSING—B.A. 2/28—Chicago Housing Auth., 608 S. Dearborn St., Zone 5, 49 row houses, incl. 300 units at Cicero and 44 Sts., $2,500,000. Naess & Murphy, 80 E. Jackson St., Chicago 4, Ill., archts. CD 2/2/50.

Mich., Muskegon—SCHOOL—Bids Asked—Catholic Central High School, Muskegon, 2 story, bsmnt., brick, stone high school. $500,000. Edwin E. Valentine, 99 Miller Ave., Muskegon, archt. CD 12/31.

SOON LETS CONTRACT—BUILDINGS

Mich., Port Huron—HOSPITAL—Bd. Trustees Port Huron Hospital, Port Huron, soon lets contract, brick, steel 50-bed hospital addn. $650,000. Smith, Hinchman & Grylls, Inc., 800 Marquette Bldg., Detroit, archt. CD 2/2/51.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **MICHIGAN**—State Hy. Dpt., 222 Townsend St., Lansing, Zone 13,

Darin & Armstrong, Inc., 2041 Fenkel St., Detroit, Mich. CA **$1,404,389**, est. $1,460,000. 2 bridges, ramp structures, west Grand Blvd. over Edsel Ford Expressway, UI B 31 and B32 of 82-22-10 C1 (UI 391-36), Wayne Co. CD 1/15, under LB.

MICHIGAN—State Hy. Dpt., 222 Townsend St., Lansing, Zone 13,

Mid-America Engineering Corp., Skokie, Ill. LB **$188,822**, est. $190,000. bit aggregate surf. 10.911 mi. M-57, M-59-41-C7, Montcalm Co. Bids Jan. 9. CD 12/28.

MICHIGAN—State Hy. Dpt., 222 Townsend St., Lansing, Zone 13,

L. W. Edison Constr. Co., Grand Rapids, Mich. CA **$548,793**, est. $550,000. dual lane c. conc. paving 3.024 mi. M-72 and M-22, F 28-8 C6 (F 415 4), Grand Traverse and Leelanau Counties. CD 1/23, under LB.

† **Thornton Constr. Co.**, Hancock, Mich. CA **$427,276.** grading, paving runway extensions, taxiways and aprons, Eng. 20-64-52-19, Kinross Air Force Base Auxiliary Field, KINROSS, MICH. U. S. Eng., 1900 Cadillac Tower, Detroit, Mich. Bids Dec. 18. CD 11/30.

BUILDINGS

LOW BIDS AND CONTRACTS

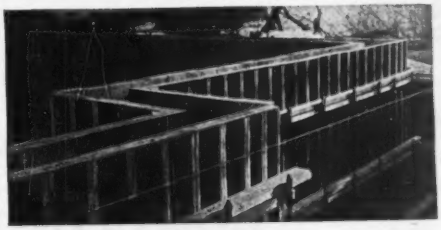
† **Ohio State Constr. Co.**, 22 E. Gay St., Columbus, O., CA. **$790,000.** 100x100 ft. paint and oil STORAGE bldg.; 140x200 ft. fire control SHOPS, 116x125 ft. attached OFFICE, 75x180 ft. projectile loading and assembling SHOP, 38x38 ft., structural steel, concrete block constant temperature MAGAZINE, at Erie Ordnance Depot, Serial No. Eng 46-022-52-89, LACARNE, O. U. S. Eng., 237 Fourth Ave., Huntington 18, W. Va. Bids Jan. 18. CD 12/12.

Fuller Constr. Co., Gardner Bldg., Toledo, O., Owner Builds. **$500,000.** HOUSING, W. Bancroft between Perth and Evansdale Ave., TOLEDO, O.

▲ **Jos. J. Duffy Constr. Co.**, 4994 Elston Ave., Chicago 30, Ill. CA, **$1,999,614**, Delancy West Housing, incl. 228 units, 21 and Polk Sts., GARY, IND. Gary Housing Auth., 400 Progress St., Gary, Ind. Bids Dec. 27, awarded Jan. 16. CD 12/14.

Brice Zeager Corp., 233 E. Ohio St., Indianapolis 5, Ind. Owner Builds. **$600,000.** 70 defense HOUSING units, Bosart and DeQuincy Sts., for employees of

ATLAS SPEED SYSTEM OF STEEL FORM CONSTRUCTION



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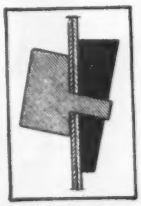

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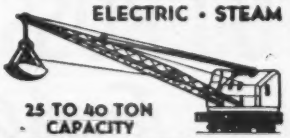

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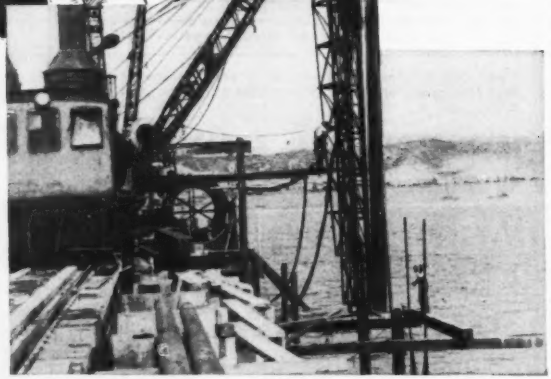

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ASSOCIATE COMPANIES—BUCK IRON COMPANY, INC., QUARRYVILLE, PA. • PRECISION DRAWN STEEL COMPANY, CAMDEN, N.J.

Allisons, Naval Ordnance Plant and Army Finance Center, INDIANAPOLIS, IND.

▲ **Hagerman Co.**, 403 Strauss St., Fort Wayne, Ind., general contract, LB $575,637.

L. J. Snyder Co., Muncie, Ind. LB, overall combined, $848,639, for Whitely HOUSING, incl. 80 units on 4½ acre site Macedonia and Centennia Aves., Whitely, MUNCIE, IND. Muncie Housing Auth., Munsyana Homes, 402 East Second St., Muncie, Ind. Bids Jan. 21. CD 1/16.

▲ **H. K. Ferguson Co.**, 1 N. LaSalle St., Chicago, Ill. CA $2,600,000. FACTORY, 7100 W. 60 St., CHICAGO, ILL. Acme Resin Co., 1401 Circle St., Forest Park, Ill. Awarded Jan. 15.

Hansell-Elcock Co., 485 W. 23 St., Chicago, Ill. CA $500,000. 2 FACTORY addns., CHICAGO, ILL. Delta Star Electric Co., Div. H. K. Porter Co., Oliver Bldg., Pittsburgh, Pa. Awarded Jan. 16. CD 1/16.

Louis Rubin, 11 S. La Salle St., Chicago, Ill., CA, $857,000, eight co-operative APARTMENTS, incl. 176 units CHICAGO, ILL. Community Development Trust 39 S. State St., Chicago, Ill. Awarded Jan. 15. CD 10/1.

J. Emil Anderson Co., 1809 Balmoral St., Chicago 40, Ill. CA $450,000. 1 story, 65,000 sq. ft. FACTORY, SKOKIE, ILL. General Controls Corp., 8062 McCormick Blvd., Skokie, Ill. Arthur Heda, 1809 Balmoral St., Chicago 40, Ill., archt. Awarded Jan. 11. CD 3/29, under LB.

Johnson & Jacobson, De Kalb, Ill., CA, $809,000, Southeast Grade SCHOOL and new West Grade School. SYCAMORE, ILL. School Dist. 427, Sycamore, Ill. Bids Dec. 6, awarded Jan. 10. CD 12/19, under LB.

▲ **The Austin Co.**, Curtis Bldg., Detroit, Mich. CA $2,500,000. 100x900 ft. FOUNDRY addn., incl. laboratory, BAY CITY, MICH. Bay City Foundry Div. Dow Chemical Co., Bay City, Mich. CD 12/12.

▲ **The Austin Co.**, 227 Curtis Bldg., Detroit, Mich. CA $1,000,000. alterations, renovations, magnesium fusion parts and wheel assemblies in plant, BAY CITY, MICH. Dow Chemical Co., 932 Fisher Bldg., Detroit, Mich. CD 12/12.

C. R. Meyer & Sons Co., 50 State St., Oshkosh, Wis. CA $638,000. POWER PLANT and DAM, CRYSTAL FALLS, MICH. Wisconsin-Michigan Power Co., Appleton, Wis. Mead & Hunt, 550 State St., Madison, Wis., archts.

▲ **Milton Ratner**, 1040 E. Grand Blvd., Detroit Mich. CA $1,594,701. Frederick Douglas APARTMENTS, twenty 2 story, brick row houses, 165 family units, Area 3, DETROIT, MICH. Detroit Housing Comn., 409 Griswold St., Detroit, Mich. Bids Dec. 17. CD 12/6.

Thompson-Schmidt Co., 18425 James Couzens Dr., Detroit, Mich. CA $415,000. 2 story, bsmnt., brick, steel McFarlane SCHOOL, Sheyenne St., DETROIT, MICH. City, 1354 Broadway, Bd. Educ., Detroit, Mich. Herman & Simon, 805 Transportation Bldg., Detroit, Mich., archts. Bids Dec. 13. CD 10/26.

▲ **Forest Homes, Inc.**, c/o Delta Realty, 1916 Cumberland St., Lansing, Mich. Owner Builds. $1,200,000. 100 ranch HOUSES, Cumberland Rd., LANSING, MICH.

▲ **Walter Nellet Co.**, 115 W. Michigan Ave., Lansing, Mich. Owner Builds. $3,000,000. 225 colonial HOMES, Gordon Ave., Pleasant Grove, and Cooper Ave. No. 2 and 3 development, LANSING, MICH. CD 2/26/51.

Campbell Constr. Co., 9301 Michigan Ave., Detroit, Mich. CA $900,000. 1 story, 200x550 ft., brick, concrete, steel FACTRY and OFFICE, LINCOLN PARK, MICH. Wisco, Inc., 3945 A St., Detroit, Mich. Hurless E. Bankes, 2317 Elmhurst St., Detroit, Mich., archt.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

† **Tex., Wichita Falls**—RUNWAYS—B.A. 2/12—U. S. Eng., Box 61, Tulsa 2, Okla., runways. Approx. $500,000. CD 2/12/51.

▲† **Kan., Topeka**—DORMITORIES—B.A. 2/15—U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo., airmen's dormitories, dormitory for women, mess and admin. bldgs., BOQ and area facilities, Forbes Air Force Base, Eng. 23-028-52-34. Plans deposit $75. CD 11/31.

Tex., Galveston—PIER—Bids Asked—Galveston Wharves, c/o E. H. Thornton, mgr., 2324 Strand St., rehabilitation of Pier 21, $750,000. CD 1/18.

BIDS ASKED—BUILDINGS

▲ **Ia., Humboldt**—GENERATING PLANT—B.A. 2/19—Corn Belt Power Co-operative, Humboldt, Section 4, of Humboldt generating plant, building and outside work, even fans, drains, electr. manholes, head wall, substa. foundations, site work and water piping; Section 5, electrical work for power plant; Section 6, echanical work at power plant. Stanley Eng. Co., Hershey Bldg., Muscatine, engr. CD 12/1/48, under Iowa.

† **N. M., Albuquerque**—ENGINEERING—B.A. 2/19—U. S. Atomic Energy Comn., P.O. Box 5400, 1 story, approx. 80,000 sq. ft. rein.-con. engineering bldg. air-conditioning, at Sandia Laboratory, Sandia Base, Inv. No. 293-52-5. $800,000-$1,200,000. Max Flatow, 1840 Campus Blvd., archt.-engr.

▲ **Tex., Mineral Wells**—HOUSING—B.A. 2/19—U. S. Eng., 1127 Texas & Pacific Bldg., Fort Worth, construct, manage finance 1,000 one story, brick, frame dwelling units at Camp Wolters Air Force Base, 950 SF. with access roads, streets, utilities and landscaping, $8,500,000. Charles E. Armstrong, 351 Majestic Bldg., Fort Worth, archt. CD 10/19.

▲† **Ark., Shumaker**—MAGAZINES—B.A. 2/29—Dist. P. Wks., Officer, 8th Naval Dist., U. S. Naval Station Building 16, New Orleans, 12, La., smokeless powder

Magazines, Naval Ammunition Depot, Spec 32941. Plans deposit $250. CD 12/12.

▲ **Tex., Borger**—HOUSING—B.A. 3/1—Borger Housing Auth., Borger, 150 dwelling units. $1,125,000. Plans deposit $50. Boese & Harkrider, Texas & Pacific Bldg., Fort Worth, engrs. and archts. CD 1/12/50.

▲ **Tex., Paris**—HOUSING—B.A. 3/1—Paris Housing Auth., Paris, 200 dwelling units, Tex 49-1 and 2. $1,550,000. Plans deposit $50. Boese & Harkrider, Texas & Pacific Bldg., Fort Worth, engrs.-archts. CD 1/12/50.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **ARKANSAS**—State Hy. Dpt., Little Rock.

D. F. Jones, Southern National Bldg., Little Rock, Ark., CA, $84,293, constr. Hy. 28, Briggsville, Yell Co.; CA, $163,506, constr. Hy. 28, Plainview, Yell Co.; CA $247,030, constr. Hys. 50 and 149, Madison, St. Francis Co.;

D. B. Hill Co., 115 N. Spring St., Little Rock, Ark., CA, $261,983, constr. Hy. 61, Marion, Crittenden Co.;

W. J. Menefee Constr. Co., Sedalia, Mo., CA, $663,401, constr. relocation part Hy. 14, Lead Hill, Boone Co.;

E. E. Barber Constr. Co., 722 Wheeler St., Fort Smith, Ark., CA, $112,742, constr. Hy. 68, Osage Creek, Carroll Co.;

Mode & McCracken, Conway, Ark., CA, $198,516, constr. Hy. 9, Center Ridge, Conway Co.;

Ben M. Hogan Co., 1100 Fairview St., Little Rock, Ark., CA, $350,072, constr. Hy. 167, Fordyce, Dallas Co.;

Buc Ton Constr. Co., Hazen, Ark., CA, $205,404, constr. Hy. 77, Manilla, Mississippi Co.;

Freshour Brothers, Inc., Sweet Home, Ark., CA, $63,630, constr. Hy. 8, Pike Co.;

Wm. D. Jeffrey Constr. Co., Inc., 4201 Towson St., Fort Smith, Ark., CA, $512,492, constr. Hy. 167, Sheridan, Grant Co.;

Ellis & Koonce, Fort Smith, Ark., CA, $125,511 constr. Hy. 49, Cincinnati, Washington Co. Grand total $2,988,580. Bids Jan. 18. CD 1/10.

▲ **Farnsworth & Chambers Co., Inc.**, Box 74, Houston, Tex., LB $6,926,483, est. $6,000,000. 10,000 lin. ft. runway extens., 200 ft. wide, using 16 in. thick concrete paving, all appurtenances at Municipal Airport, TULSA, OKLA. Douglas Aircraft Co., 3000 Ocean Park Blvd., Santa Monica, Calif. Bids Jan. 15. CD 1/8.

▲ **Anderson Bros. Corp.**, 707 N. Drennan St., Houston, Tex., CA. $1,975,000. 50 mi. 26 in. pipe between Grandbury and Wortham, TEXAS. West Texas Gulf Pipe Line Co., Midland, Tex. CD 10/11.

▲ **H. B. Zachry Co.**, Box 2570, San Antonio, Tex., CA. $1,317,003. filtration and pumping plant, LAREDO, TEX. City, Waterworks Dept., Laredo, Tex. Bids Dec. 17, awarded Jan. 15. CD 12/28, under LB.

† **Bonneville Power Admin.**, 827 N.E. Oregon, Portland, Ore., rejected bids Jan. 7, Inv. 6229, Hot Springs-Anaconda 230 line, Schedule 2, Sanders, Lake, Missoula, Grainite, Powell and Deer Lodge Counties, MONTANA. LB $834,705. CD 1/15, under LB.

† **Montgomery Electric Co.**, 2375 N.W. Thurman St., Portland, Ore. CA $821,839. Inv. 6229, Schedules 1 and 3, Hot Springs-Anaconda 230 kv line, Sanders, Lake, Missoula, Granite, Powell and Deer Lodge Counties, MONTANA. Bonneville Power Admin. 827 N.E. Oregon St., Portland, Ore. Awarded Jan. 17. CD 1/15.

† **Parker-Schram Co.**, Builders Exchange Bldg., Portland, Ore. CA $840,391. Inv. 6131, constr. 78.6 mi. Hungry Horse-Hot Springs 230 kv line, Flathead, Lake and Sanders Counties, MONTANA. Bonneville Power Admin., 827 N.E. Oregon St., Portland, Ore. Bid Nov. 13, awarded Nov. 19. CD 11/27, under LB.

▲ **Morrison-Knudsen Constr. Co.**, 319 Broadway, Boise, Idaho. CA grading only.

Union Pacific R.R. Co., W. C. Perkins, ch. engr., 1416 Dodge St., Omaha, Neb. Own Forces. constr. 42 mi. new double track line from Cheyenne to Dale Creek, WYOMING. Total cost $16,000,000.

BUILDINGS

LOW BIDS AND CONTRACTS

† **Atlas Constr. Co.**, Box 1106, Texarkanas, Ark., CA $623,948, CAFETERIA, SHUMAKER, ARK. Officer-In-Charge Construction, Naval Ammunition Depot, Shumaker, Ark. Bids Nov. 28. CD 11/8.

▲† **Peterson, Garbi & Joseph, Inc.**, 123 E. 9 St., North Little Rock, Ark., CA, $976,400, erecting BARRACKS, at Naval Ammunition Depot, Spec. 32573, SHUMAKER, ARK. Dpt. Navy Ordnance Bureau, 18 St. and Constitution Aves. N. W., Wash., 25, D. C. Bids Nov. 14. CD 11/27, under LB.

▲ **Omaha Public Power Dist.**, 17 and Harney Sts., Omaha, Neb., rejected bids Jan. 11, intake construction at the Missouri River, a 60 thousand kilowatt GENERATOR and boiler, OMAHA, NEB. Total est. $14,000,000. Will re-advertise. (Correction—status). CD 1/8, under CA.

D. C. Evans, Lawton, Okla. Owner Builds. $575,000. 76 rental HOUSING apartments, near LAWTON, OKLA. Charles Gallager, Lawton, Okla., engr. Awarded Jan. 16.

▲ **Farnsworth & Chambers Co., Inc.**, Box 74, Houston, Tex., LB $1,495,789. 38 buildings for total 200 low-cost rental HOUSING units, BEAUMONT, TEX. Beaumont, Housing Auth., Beaumont, Tex. Bids Jan. 17. CD 1/8.

† **Glade Constr. Co.**, 403 Century Bldg., Fort Worth, Tex. CA. $887,573. 2 WAREHOUSES and concrete apron around them at Quartermaster Depot, Inv. No. 41-443-52-6, FORT WORTH, TEX. U. S. Eng., 1127 Texas & Pacific Bldg., Fort Worth, Tex. Bids Jan. 5, awarded Jan. 9. CD 1/3, under LB.

▲ **M. W. Kellogg Co.**, 225 Broadway, New York, N. Y., CA. Est. $10,000,000. design and construct REFINERY, Orthoflow catalytic cracker, new 20,000 bbl. per day vacuum feed preparation unit, catalytic polymerization unit, light ends recovery, sulfur removal equip. and revamping thermal cracking facilities, at Smith's Bluff, HOUSTON, TEX. Pure Oil Co., 1st. Natl. Bank Bldg., Houston, Tex. CD 11/8.

Sheffield Steel of Texas, Industrial Rd., Houston, Tex., Own Forces, $950,000. OPEN HEARTH FURNACE unit. HOUSTON, TEX. CD 3/22/51.

▲ **R. F. Ball Constr. Co. Inc.**, 3200 W. Dallas St., Houston, Tex., LB $2,890,088, 400 unit HOUSING, Project Tex. 6-6, Brady Blvd. and Frio City Rd., SAN ANTONIO, TEX. San Antonio Housing Auth., 400 Labor St., San Antonio, Tex. Bids Jan. 22. CD 12/27.

▲ **Spurr Homes, Inc.**, Mark S. Waggener, pres., 604 Mining Exchange Bldg., Denver, Colo. Owner Builds, $1,500,000, RESIDENCES, PUEBLO, COLO. CD 10/10/49.

Lembke-Clough & King, P.O. Box 245, Aubuquerque, N. M., CA. $838,994, est. $725,000. precast hollow concrete block GEOLOGY BLDG., ALBUQUERQUE, N. M. Bd. Regents, University of New Mexico, Albuquerque, N. M. Bids Oct. 26, awarded Jan. 14. CD 11/5, under LB.

▲† **Robert E. McKee, P. O. Box 1706, Santa Fe, N. M.**, LB $2,878,300, est. $3,565,407, approx. 75,000 sq. ft. rein.-con., structural steel, metal siding PHYSICS Bldg., TA-3, Phase B, grading, paving, utility systems, Inv. No. 291-52-29, LOS ALAMOS, N. M. U. S. Atomic Energy Comn., Los Alamos, N. M. Bids Jan. 15. W. C. Kruoer & Assoc., 302 E. Palace St., Santa Fe, N. M., archts.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

February 13 California

STREETS AND ROADS

February 7 Nevada — February 13 California

† **California**—B.A. 2/15—U. S. Eng., 51 S. Figueroa St., Los Angeles, constr. gates, footbridge, generator house, etc. Over $500,000. CD 1/21/45.

▲† **Idaho**—B.A. About 3/6—U. S. Eng., 4735 E. Marginal Way, Seattle, 4, Wash., hydro-electric power house, Albeni Falls Proj., Priest River, Serial No. CIVENG 45-108-52-29.

† **Oregon**—B.A. 3/10—U. S. Eng., 628 Pittock Block, Portland, Zone 5, hauling, installing certain Govt.-furnished machinery and equip.; furnishing, installing other material and equip., and for completing various features of architectural work, for Detroit Dam Power House, CIVENG 35-026-52-136. Over $500,000. Plans deposit $100.

BIDS ASKED—BUILDINGS

Calif., Orange—SCHOOL—B.A. 2/19—Orange City School Dist., 370 N. Glassel St., high school, Shaffer and Walnut Sts. $500,000. Plans deposit $50. Marsh, Smith & Powell, 208 W. 8 St., Los Angeles, Calif., archts. CD 3/7.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **Guy F. Atkinson Co. and Willamette Iron & Steel Co.**, 2860 N. W. Front St., Portland, Ore., CA. $517,959. tainter gates, hoists, Detroit Dam, CIVENG 35-026-52-37, Marion Co. OREGON. U. S. Eng. Pittock Block, Portland, Ore., Bids Oct. 24, awarded Nov. 29. CD 11/12 under LB.

J. A. Thompson & Son, Box 518 Inglewood, Calif. LB $446,013, imprv. La Cienega Blvd. Stocker St. to Rodeo Rd., Culver City, CCO-682, LOS ANGELES, CALIF. Bd. Supervs., Los Angeles Co., Hall of Records, Los Angeles, Calif. Bids Jan. 15. CD 1/2.

▲† **George W. Carter Co.**, 1721 W. Olympia St., Los Angeles, Calif., CA. $1,783,588, construct supply, public works, office, shops, refrigerated storage bldg., utilities and paving at U. S. Naval Air Missile Test Center, Spec. 32575, POINT MUGU, CALIF. P. Wks. Office, U. S. Naval Air Missile Test Center, Point Mugu, Calif. Bids Dec. 18, awarded Jan. 14. CD 12/26, under LB.

† **Gould & Cross**, 636 Quay Way, Wilmington, Calif., LB, $555,479, high velocity launching facilities, Spec. 32904, SAN CLEMENTE ISLAND, CALIF. Dpt. Navy, Naval Ordnance Test Station, Inyokern, Calif. Bids Jan. 15. CD 12/31.

▲ **Walsh Constr. Co.**, 785 Market St., San Francisco, Calif., LB, $1,419,000, constr. water treatment plant at Fleming Hill, VALLEJO, CALIF. City, City Hall, Vallejo, Calif. Bids Jan. 14. CD 12/27.

BUILDINGS

LOW BIDS AND CONTRACTS

Triangle Builders, Idaho Falls, Idaho, CA. $974,498. construct 4 BUILDINGS for Weber Junior College's new campus, OGDEN, UTAH. State Bldg. Bd., State Capitol, Salt Lake City, Utah. Bids Dec. 28. CD 12/10.

† **John H. Sellen Constr. Co.**, 228 9 Ave. N. Seattle, Wash. LB $789,179, est. $681,192. 180x700 ft. tire storage WAREHOUSE at Mount Ranier Ordnance Depot, Inv. Eng. 45-108-52-102, FORT LEWIS, WASH. U. S. Eng., 4735 E. Maryinal Way, Seattle, Wash. Bids Jan. 16. CD 11/7.

Ostruske-Murphy Co., Inc., 2907 A St., Tacoma, Wash. LB $974,250. general contract;

Urban P. and H. Co., 103 S. 28 St., Tacoma, Wash. LB $307,748. mechanical work. 12 one story, rein.-con. bldgs. for HIGH SCHOOL, PARKLAND, WASH. Franklin Pierce School Dist. 402, Parkland, Wash. Bids Jan. 6. CD 12/31.

† **Strand & Sons**, 3939 University Way, Seattle 5, Wash CA $795,098, est. $768,749. two 165-man BARRACKS at Madigan Army Hospital, Inv. 52-84, TACOMA, WASH. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. CD 12/27, under LB.

Wm. C. Crowell Co., 170 E. California St., Pasadena, Calif., LB, $523,090, constr. Andreas Elementary SCHOOL, DUARTE, CALIF. Duarte Elementary School Dist., Duarte, Calif. Bids Jan. 11. CD 12/21.

Louis C. Dunn Co., 3101 Wilshire Blvd., Los Angeles, Calif., CA, $612,500, yard development, paving, fencing, conduits, etc., EL SEGUNDO, CALIF. The Douglas Aircraft Co., Inc., 827 Lapham St., El Segundo, Calif. Bids Nov. 13, awarded Dec. 21. CD 11/26, under LB.

† **Haddock Engineers Ltd.**, 1616 S. Greenwood Ave., Montebello, Calif., LB, $890,000, North and South Elementary SCHOOL, INYOKERN, CALIF. Housing & Home Finance Agency, 1031 S. Broadway, Los Angeles, Calif. Bids Jan. 17. CD 12/28.

Sherman H. Johnson, 10329 E. Weaver St., El Monte, Calif. CA. $730,003, Corvalis SCHOOL, NORWALK, CALIF. Norwalk School Dist. 12110 E. Walnut St., Norwalk, Calif. Bids Oct. 23, awarded Jan. 9. CD 11/5, under LB.

Zimmer Constr. Co., 1227 S. LaBrea Ave., Los Angeles, Calif., CA $862,872, construct, manage, finance 126 DWELLING units, incl. streets, walks, services and site imprvs., PORT CHICAGO, CALIF. Richard L. Fairless Co., 426 Fidelity Bldg., Los Angeles, Calif., (sponsor, builder). CD 12/18, under LB.

▲ **Seabord Constr. Corp.**, 9757 Sunset Blvd., Los Angeles, Calif. Owner Builds. Approx. $1,500,000. 184 frame, stucco DWELLINGS, 190 St., Prairie Ave., Hawthorne Blvd., TORRANCE, CALIF. Southwest Drafting Service, 2724 W. Florence Ave., Los Angeles, archts.

ALASKA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **Pacific Constr. Co.**, Vancouver, Wash., LB $408,500, est. $452,425, 1 story, 63x137 ft. and 30x80 ft., concrete enlisted men's service club, S95-507-52-17. Ladd Air Force Base, ALASKA. U. S. Eng., (APO 942, c/o PM, Seattle, Wash.) Anchorage, Alaska. Bids Jan. 17. CD 12/26.

▲† **Vaile-Sommers Constr. Co.**, 407 3 Ave. W., Seattle Wash. LB $2,128,000, est. $1,734,973, 3 story, bsmnt., 19,000 sq. ft. converted 500-man barracks, Inv. S95-507-52-32, Elmendorf Air Force Base, ALASKA. U. S. Eng., (APO 942, c/o PM, Seattle, Wash.) Anchorage, Alaska. Bids Jan. 18. CD 12/19.

† **Island Homes, Inc.**, Fairbanks, Alaska, and **Neise Mortensen & Co., Inc.**, 1021 Westlake Ave. N., Seattle, Wash., LB $493,699, sewerage sys., pumping and treatment plant, paving and lighting, sidewalks, curbs, etc. in Slater Sub-division on Bentley Island, Proj. Aaa 50-A-124, FAIRBANKS, ALASKA. Alaska P. Wks., Dpt. Interior, 123 3 St., Juneau, Alaska. Bids Jan. 16. CD 12/19.

CANADA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NOVA SCOTIA**—Halifax-Dartmouth Bridge Comn., H. J. Egan, secy., 140 Roy Bldg., Halifax,

Foundation Maritime Ltd., 150 Lower Water St., Halifax, N. S., CA, bridge piers;

McDonald Constr. Co., Ltd., 76 Sullivan St., Halifax, N. S., CA, plaza and approaches, for bridge across Halifax Harbor. Est. $1,789,487. Bids Jan. 17. CD 12/4.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Pigott Constr. Co. Ltd.**, 36 James St. S., Hamilton, Ont., CA. Approx. $1,626,000. 5 story bsmnt., steel frame, brick HOSPITAL addn., concrete fdns., PEMBROKE, ONT. Pembroke General Hospital, 697 MacKay St., Pembroke, Ont. W. L. Somerville, McMurrich & Oxley, 1104 Bay St., Toronto, Ont., archts. H. H. Angus & Assoc., Ltd., 615 Yonge St., Toronto, Ont., engrs. CD 11/20.

Walter Davidson Co. Ltd., 88 Duke St., Toronto, Ont., CA, $619,035, est. $600,000, 2 story, bsmnt., steel masonry, T-shaped, collegiate and vocational SCHOOL addn., WESTON, ONT. Weston Bd. Educ., Ralph St., Weston, Ont. Bids Dec. 20, awarded Jan. 17. CD 12/5.

Desourdy Constr. Ltd., 142 North St., Cowansville, Que., LB, $500,000, 1 story, 150x175 ft., steel, brick, concrete block FACTORY, Westmount St., COWANSVILLE, QUE. Town, J. R. Ouelette, secy., Cowansville, Que. CD 1/21.

▲ **G. Daneau Ltd.**, 5920 Cote des Neiges Rd., Montreal, Que. Owner Builds, $1,500,000, ten 3 story, bsmnt., concrete, brick, block, stone 16 suites, each APARTMENT BLOCKS, Maplewood Ave., between Victoria and Westbury Aves., MONTREAL, QUE. C. Grenier, 170 Geneva Crescent, Mount Royal, Que., archt.

(Proposal Advertisements see pp. 78 to 79)

OFFICIAL PROPOSALS

RATE: *THE RATE FOR OFFICIAL PROPOSAL ADVERTISING IS $1.25 PER LINE (OR FRACTION) PER INSERTION.*

CLOSING DATE: *FRIDAY 10:30 A. M. FOR THE ISSUE DATED THE FOLLOWING THURSDAY.*

SEND COPY TO: *OFFICIAL PROPOSAL DIVISION, ENGINEERING NEWS-RECORD, 330 W. 42ND ST., NEW YORK 36, N. Y.*

Bids: April 22, 1952

Super Structure, Halifax-Dartmouth Bridge

CONTRACT NO. 3

Sealed tenders addressed to the undersigned and marked as instructed will be received at the office of the undersigned until 12 o'clock noon, Atlantic Standard Time, April 22nd, 1952, for the construction of the super structure of the Halifax-Dartmouth Bridge in the Province of Nova Scotia, in accordance with the plans and specifications available at the office of Dr. P. L. Pratley, 909 Drummond Building, Montreal, Quebec, and available for inspection at the office of C. A. Fowler and Company, 422 Capitol Building, Halifax, Nova Scotia, on or after January 22nd, 1952. These plans may be borrowed from the Engineer by recognized General Contractors on deposit of certified cheque for $100.00 guaranteeing the return of the plans. This deposit will be returned to all bidders on return of the plans to the office from which they were borrowed, and will be forfeited if the plans are lost, destroyed or damaged.

A certified cheque for ten percent of the amount of the tender made payable to the order of the Halifax-Dartmouth Bridge Commission, or alternatives as described in the instructions to bidders must accompany each bid, and tenders must be on the forms provided. The above deposit will be returned in the case of non-acceptance and be forfeited in case the successful tenderer does not proceed to the satisfactory completion of the contract.

A signed copy of the "Instructions to Bidders" must accompany each bid.

Tenders will only be considered from established General Contractors.

Tenderers must state names and quotations of sub-contractors. The lowest, or any tender, not necessarily accepted.

Halifax-Dartmouth Bridge Commission
H. J. Egan, Secretary,
140 Roy Building,
Halifax, N. S.

Bids: February 14, 1952

New Jersey Road Work

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

ROUTE 3, SECTION 1D

Construction of Route 3, Section 1D, Overpass Bridge & Approaches on Paterson Plank Road, in the Town of Secaucus, Hudson County, Federal Project No. U-166(2). The principal items of construction are:

Roadway Items

Estimated:
12,278 cu. yds. Roadway Excavation-Earth
18,500 sq. yds. 10" Concrete Pavement, Rein.
877 lin. ft. Rein. Conc. Pipe, various sizes
12,315 lin. ft. Concrete Curbs

Bridge Items

1,492 cu. yds. Concrete in Structures
221,180 lbs. Reinforcement Steel in Structures
795,000 lbs. Structural Steel

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Thursday 14, 1952, at eleven o'clock (11:00 A.M.—EASTERN STANDARD TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Project" authorized by the provisions of Title 27 of the Revised Statutes of New Jersey and supplements and by P. L. 769, 81st Congress, and is to be performed in accordance with the special provisions and requirements of the Bureau of Public Roads, Department of Commerce, as outlined in the specifications, which provisions required that labor be employed from lists furnished by the State Employment Service, 404-38th Street, Union City, New Jersey. The attention of bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all common labor employed on this contract shall be $.75 per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be $1.00 per hour. The minimum wage paid to all skilled labor employed on this contract shall be $1.50 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

Bids: February 19, 1952

Sewerage System, Sewage Treatment Plant, Sewage Pumping Station and Force Mains

For
SHIPPENSBURG BOROUGH AUTHORITY
At
Shippensburg, Pennsylvania

Sealed proposals will be received at the Shippensburg Municipal Building, 135 East King Street, Shippensburg, Pennsylvania, by Paul B. Noftsker, Secretary of the Shippensburg Borough Authority, until 7:00 P.M., E.S.T., Tuesday, February 19, 1952, for furnishing all necessary labor, materials, and equipment, and performing all work for construction of SEWERAGE SYSTEM, SEWAGE TREATMENT PLANT, SEWAGE PUMPING STATIONS AND FORCE MAINS. Bids will be publicly opened and read at 7:30 P.M., E.S.T., Tuesday, February 19, 1952, in the Shippensburg Borough Council Meeting Room on the second floor of the Shippensburg Municipal Building at 135 East King Street, Shippensburg, Pennsylvania. Separate proposals will be received upon five (5) parts of the project as follows:

Contract One—CONSTRUCTION OF A SEWERAGE SYSTEM.
Contract Two—GENERAL CONSTRUCTION OF A SEWAGE TREATMENT PLANT, SEWAGE PUMPING STATIONS AND FORCE MAINS.
Contract Three—PLUMBING WORK IN CONNECTION WITH CONSTRUCTION OF A SEWAGE TREATMENT PLANT.
Contract Four—HEATING WORK IN CONNECTION WITH CONSTRUCTION OF A SEWAGE TREATMENT PLANT.
Contract Five—ELECTRICAL WORK IN CONNECTION WITH CONSTRUCTION OF A SEWAGE TREATMENT PLANT AND SEWAGE PUMPING STATIONS.

Each proposal shall be accompanied by a certified check in amount not less than five (5) per cent of the bid total, or a bid bond in amount not less than seven and one-half (7½) per cent of the bid total, all in accordance with provisions contained in the Specifications.

Copies of the Contract Documents, including Plans and Specifications will be available for inspection at the office of Gannett Fleming Corddry and Carpenter, Inc., 600 North Second Street, Harrisburg, Pennsylvania, and at the office of Paul B. Noftsker, Secretary of the Shippensburg Borough Authority, in the Shippensburg Municipal Building, at 135 East King Street, Shippensburg, Pennsylvania; or they may obtained from the first of the above stated places upon deposit of the following amounts for each set:

Contract One—SEWERS, $25.00.
Contract Two—GENERAL CONSTRUCTION, $20.00.
Contract Three — PLUMBING WORK, $10.00.
Contract Four—HEATING WORK, $10.00.
Contract Five — ELECTRICAL WORK, $10.00.

Full refund will be made to actual bidders for return of one of each set in good condition within ten (10) days after closing date for receipt of bids; refund for return of all other sets, in good condition within the same period, will be fifty (50) per cent of the deposit.

N.P.A. controlled materials rating DO-T-8 issued for this Project.

SHIPPENSBURG BOROUGH AUTHORITY,
Shippensburg, Pennsylvania
Gannett Fleming Corddry & Carpenter, Inc., Engrs.,
600 North Second Street,
Harrisburg, Pennsylvania

Bids: February 26, 1952

Sewage Treatment Plant

NAUGATUCK, CONN.

Sealed proposals for the construction of a sewage treatment plant in the southerly portion of the Borough of Naugatuck will be received by the Board of Warden and Burgesses in the Town Hall, Naugatuck, Connecticut, until 7:30 P.M., Eastern Standard Time on February 26, 1952, at which time and place they will be publicly opened and read.

The work includes the construction of an inverted siphon across the Naugatuck River from the existing trunk sewer on the east bank; screen and grit chamber; pumping station; two settling tanks; a service building; two sludge digestion tanks and control house; sludge drying beds and appurtenant work.

Copies of contract documents, including plans and specifications, may be examined at the office of the Borough Engineer, Town Hall, Naugatuck, Connecticut, or at the office of Malcolm Pirnie Engineers, 25 West 43rd Street, New York 36, N. Y., or may be obtained at either of said offices on and after February 4, 1952, upon deposit of Thirty-Five Dollars ($35.) for each set furnished, which sum will be refunded to bidders upon return of plans and specifications in good condition within ten (10) days after award of contract.

Each proposal must be accompanied by a certified check in the sum of ten (10) percent of the amount of the bid, payable to the Borough of Naugatuck. A performance and labor bond in the amount of the bid of the successful bidder will be required.

The Board of Warden and Burgesses reserve the right to reject any or all bids.

BOROUGH OF NAUGATUCK
Charles F. Daly,
Borough Clerk

OFFICIAL PROPOSALS

Bids: February 28, 1952

Water Filtration Plant

City of Trenton, New Jersey
General Construction ....Contract 2
Pumping Equipment .....Contract 2A
Electrical Work .....Contract 2E
Heating and Ventilating..Contract 2H
Plumbing .....Contract 2P
Structural Steel .....Contract 2S
Trenton, New Jersey

Sealed proposals will be received by the City Clerk of the City of Trenton, New Jersey, at the Commission Chamber, City Hall, Trenton, New Jersey, on February 28, 1952 at 2:00 P. M. Eastern Standard Time, at which time and place proposals will be publicly opened and read for the Water Filtration Plant: General Construction, Contract 2; Pumping Equipment, Contract 2A; Electrical Work, Contract 2E; Heating and Ventilating, Contract 2H; Plumbing, Contract 2P; Structural Steel, Contract 2S.

Copies of the plans and specifications and blank proposals may be examined and obtained at the office of the Superintendent and Engineer of Water Works, 857 Calhoun Street, Trenton, New Jersey, or at the offices of Bowe, Albertson & Associates, Engineers, Suite 916, 110 William Street, New York 38, New York, after January 28, 1952.

A deposit of fifty dollars will be required for each set of plans and specifications taken from the above offices. The entire deposit will be refunded if a bid is submitted and the plans and specifications are returned in good condition on or before April 1, 1952. After that date no plans or specifications will be redeemed and the entire deposit shall be forfeited. Where no bid is submitted and the plans and specifications are returned on or before the date hereinbefore specified, only one-half the entire deposit shall be returned.

Extra copies of specifications may be obtained at the cost of twenty dollars each and extra sets of plans may be obtained at the cost of twenty-five dollars each, which sums will not be refunded. Extra sheets may be obtained at the cost of one dollar each which sum will not be refunded.

Each bid must be accompanied by cash, certified or cashier's check to the order of the City of Trenton in an amount equal to five percentum of the amount of the bid, and a bid letter from a surety company licensed to conduct business in New Jersey agreeing to furnish a performance bond upon award of the contract.

Each bid must be made upon the blanks included in the "Supplement To Advertisement, Instructions to Bidders, Proposal, Contract, Bond and Specifications for the Construtcion of aWter Filtration Plant," dated, 1952. In the case of corporations not chartered in New Jersey, each bid must be accompanied by proper certificate that such corporation is authorized to do business in New Jersey.

Bids will not be received before or after the time specified for the opening of the bids. Bids submitted before the hour appointed, or thereafter will be deemed invalid and returned unopened to the bidder.

The Board reserves the right to reject any and all bids and to waive any defects or informalities in the bids received.

THADDEUS J. BURNS
City Clerk

DATED: January 24, 1952

Bids: February 27, 1952

Miscellaneous Work in New Jersey

Notice is hereby given that sealed proposals will be received in the office of the Director, Division of Purchase and Property, Room 318, State House, Trenton 7, New Jersey, for the following:

Boiler breeching, mechanical piping, platforms and ladders, and electrical work for the Reformatory for Women at Clinton, New Jersey;

Boiler breeching, mechanical piping, platforms and ladders, and electrical work for the Tuberculosis Sanatorium at Glen Gardner, New Jersey;

Boiler breeching, mechanical piping, platforms and ladders, and electrical work for the State Prison Farm at Bordentown, New Jersey;

Boiler breeching, mechanical piping, electric work, structural steel and general construction at the New Jersey State Hospital at Trenton, New Jersey; Platforms and ladders only for the State Colony at Woodbine, New Jersey.

Bids for the above will be received at the office of the Director, Division of Purchase and Property, State House, W. State St., Trenton 7, New Jersey on Wednesday, February 27, 1952 at two (2:00) o'clock, and will be opened and read immediately thereafter.

Bidds must be made on the standard proposal form, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than 5% of the amount of the bid, cash, in the amount of 5% of the bid or a bid bond in the amount of 5% of the bid, and must be delivered at the above place on or before the hour named, as no bid will be accepted after the hour specified. Bids not submitted on the standard proposal form or enclosed in other than special addressed envelopes will be considered informal and will be rejected. The Director reserves the right to reject any and all bids and to award contract in part or whole if deemed to the best interests of the State to do so. The successful bidder will be required to qualify for surety bond in the full amount of the contract, of a company authorized to do business in the State of New Jersey.

DEPARTMENT OF THE TREASURY
Division of Purchase and Property
Fred V. Ferber, Director.

Bids: February 5, 1952

Electric Substations and Transformers

CONTRACT 414

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 11:00 A. M., Eastern Standard Time, on Tuesday, February 5, 1952, for Contract 414, for furnishing, testing and delivering two 150-Kva. indoor unit substations and two 45-Kva. indoor and three 15-Kva. outdoor transformers for the Neversink and East Delaware intake chambers and the Downsville release water chamber of the Delaware aqueduct, all as set forth in the specifications.

No bid will be received and deposited unless accompanied by a certified check upon a National or State bank, drawn and made payable to the order of the Comptroller of The City of New York, in the amount of two thousand dollars ($2,000.00), for the proper execution of the contract.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawing, requirements as to surety, etc., can be obtained in Room 1311, at the above address, upon application in person or by mail, by depositing the sum of five dollars ($5.00) in cash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of four dollars ($4.00) will be made for each other pamphlet returned in acceptable condition. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, RUFUS E. McGAHEN, EDWARD C. MAGUIRE, Commissioners, Board of Water Supply; RICHARD H. BURKE, Secretary.

U. S. Government

GOVERNMENT OF THE DISTRICT OF COLUMBIA, DIRECTOR OF HIGHWAYS, D. C., January 31, 1952. SEALED PROPOSALS will be received in Room 509, District Building, 14th and E Streets, N. W., Washington 4, D. C., until 2:00 P. M. Eastern Standard Time, February 21, 1952, and then publicly opened and read for REPAINTING THE SUPERSTRUCTURE OF SOUSA BRIDGE over the ANACOSTIA RIVER in line of Pennsylvania Avenue, S. E. The bridge, built in 1941, is 1,386 feet in length and consists of nine plate-girder continuous type spans of 154 feet each supported on masonry piers and abutments. Each span has four main girders with 36" WF section floorbeams and 21" WF stringers suporting the 60' roadway and with cantilever built-up brackets supporting the two 6' sidewalks. The approximate weight of the structural steel is 4,670 tons. Proposal forms and specifications may be obtained without charge from the Office of the Chief Clerk, Engineer Department, Room 427, District Building, Washington 4, D. C. (Telephone NAtional 6000, Extension 2378).

OFFICIAL PROPOSALS

Bids: February 5, 1952

Chlorinating Equipment

CONTRACT 329

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 11:00 A.M., Eastern Standard Time, on Tuesday, February 5, 1952, for Contract 329, for furnishing, delivering, installing and testing chlorinating equipment for the Rondout, West Branch and Kensico South effluent chambers of the Delaware aqueduct, all as set forth in the specifications. The locations of the proposed work are in the Towns of Wawarsing, Ulster county, Carmel, Putnam county and Mount Pleasant, Westchester county, New York.

No bid will be received and deposited unless accompanied by a certified check upon a National or State bank, drawn and made payable to the order of the Comptroller of The City of New York, in the amount of twenty thousand dollars ($20,000.00), for the proper execution of the contract.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc., can be obtained in Room 1311, at the above address, upon application in person or by mail, by depositing the sum of five dollars ($5.00) in cash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of four dollars ($4.00) will be made for each other pamphlet returned in acceptable condition. Arrangements will be made whereby prospective bidders desiring blueprints of the contract drawings for their own use may secure same, the cost thereof to be paid by them. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, RUFUS E. McGAHEN, EDWARD C. MAGUIRE, Commissioners, Board of Water Supply; RICHARD H. BURKE, Secretary.

Bids: February 11, 1952

Aluminum Lettering

THE PORT OF NEW YORK AUTHORITY
PORT AUTHORITY BUS TERMINAL
CONTRACT BT-110.047

Sealed proposals for the furnishing and installation of aluminum lettering on the exterior walls of the Port Authority Bus Terminal will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 8th Ave., New York 11, until 11:30 A.M. Monday, Feb. 11, 1952, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Chief Engineer and copies will be furnished upon deposit of $10 per set. The deposit will be remitted if the documents are returned in good condition, not later than 30 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

New York, January 31, 1952.

Bids: February 20, 1952

Building No. 139

THE PORT OF NEW YORK AUTHORITY
PORT NEWARK
CONTRACT PN-150.003

Sealed proposals for the construction of Building No. 139 at Port Newark will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 8th Ave., New York 11, until 11:30 A.M. Wednesday, Feb. 20, 1952, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Chief Engineer and copies will be furnished upon deposit of $25 per set. The deposit will be remitted if the documents are returned in good condition, not later than 30 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

New York, January 31, 1952.

CLASSIFIED SEARCHLIGHT SECTION ADVERTISING

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AN ADVERTISING INCH is measured ⅞ inch vertically on one column,-3 columns—30 inches —to a page. E.N.R.

NEW ADVERTISEMENTS Address New York Office, 330 W. 42nd St., N. Y. 36, for Feb. 14th issue closing Feb. 4th.

STRUCTURAL ENGINEERING
ARCHITECTURAL ENGINEERING
OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. Forty-first year. Write today.
WILSON Engineering Corp.
College House Offices - HARVARD SQUARE, CAMBRIDGE, MASS.

COST ENGINEER
(Construction)

California assignment open to graduate Mechanical Engineer with wide cost experience on heavy construction. Excellent opportunity to associate with a leading engineering and construction firm. Your reply will be held confidential.

Please write immediately giving complete qualifications.

P-3132, Engineering News-Record
68 Post St., San Francisco 4, Calif.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

CIVIL ENGINEER with a minimum of 3—5 years experience in the design of sanitary sewers. Must be thoroughly competent to take over the complete design of a sewer system for a population of 60,000 in all details. Work is located at Morrisville, Pennsylvania. Phone Manhasset 7-0777, C. A. Monroe, 1900 Northern Boulevard, Manhasset, New York.

COST ACCOUNTANT—Experienced in heavy construction costs with knowledge of estimating. Submit complete resume stating experience, age, education and salary expected. P-3158, Engineering News-Record.

DESIGN ENGINEER and Design Draftsman, each having a minimum of five years experience in the sanitary engineering field. Salary commensurate with experience and ability. Long established consulting engineering firm located in Maryland. Our employees know of this advertisement. P-3121, Engineering News-Record.

DRAFTSMEN, STRUCTURAL steel checkers and detailers—experienced men only. Excellent working conditions. Structural Drafting Service, 4506 Euclid Ave., Cleveland 3, Ohio. Phone HE 15662.

ENGINEERS & DRAFTSMEN: Experienced in design of locomotive cranes, tractor cranes and material handling equipment. Apply by letter stating qualifications, to the Ohio Locomotive Crane Company, Bucyrus, Ohio. Attention Chief Engineer.

ESTIMATOR LARGE Public Works Contractor has Immediate opening for A-1 Experienced Estimator on General Construction Work. Excellent Opportunity. Write details giving experience, references, salary, etc. Only top qualified man will be considered. P-3107, Engineering News-Record.

EXPERIENCED AND Qualified estimator for general building construction. Must be thoroughly familiar with building plans and experienced in pricing and purchasing for building construction. Applicant should submit a proven experienced record. A very attractive proposition can be offered to a qualified man preferably under 40. Location in Central Texas. P-3069, Engineering News-Record.

POSITIONS VACANT

HEATING AND Ventilating Engineer familiar with requirements for groups of structures including air conditioning and refrigeration, steam plants and distribution systems. Long term employment indicated in office located on Eastern Seaboard. In reply, give experience record, salary desired and date available. P-3076, Engineering News-Record.

MATERIALS ENGINEER—C.E. experienced in highway materials, permanent, good salary and opportunity. Give full information. P-2943, Engineering News-Record.

STRUCTURAL ENGINEER — experienced in design of wood, concrete, and steel frames for industrial buildings and warehouses, including foundations. Permanent assignment. Free insurance and contributory retirement. Free parking. Company operated dining rooms. Write details to Personnel Division, H. J. Heinz Company, P.O. Box 57, Pittsburgh 30, Pa.

STRUCTURAL STEEL Detail Draftsmen and Checkers. All types of structures. Vacation, group insurance, good working conditions. Only top quality men. Send complete written information. Bristol Steel & Iron Works, Inc., Bristol, Virginia-Tennessee.

SUPERINTENDENT: MUST be experienced in estimating, negotiating field and especially supervise "Guniting". Pressure Grouting, Concrete and Masonry Restoration. Also New Construction for Railroads, Utilities and Industrial Plants. State age and experience. Salary open. P-2978, Engineering News-Record.

WANTED IMMEDIATELY Superintendent thoroughly experienced to supervise on large canal and levee project in Southeast. Must be good organizer, producer, know men and equipment. Write stating qualifications. P-2925, Engineering News-Record.

SELLING OPPORTUNITIES OFFERED

SALES ENGINEER for large concern in construction field. Must have degree in civil engineering. Prefer person having experience in contacting engineers, contractors, and promoting federal projects. Desire resident of Washington, D. C., vicinity, where position is located. SW-3139, Engineering News-Record.

WANTED—ELECTRICAL machinery salesman, college graduate with at least five years experience. Duquesne Electric & Mfg. Co., 6428 Hamilton Avenue, Pittsburgh 6, Pennsylvania.

EMPLOYMENT SERVICE

ENGINEERS NEEDED in all fields at all levels. Salaries commensurate with experience & ability. Highly confidential service. Bring or mail 2 resumes to: Position Securing Bureau Inc. (Agency), 45 John St., N. Y. 38, N. Y.

SALARIED POSITIONS $3,500—$35,000
We offer the original personal employment service (established 42 years.) Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars.
R. W. BIXBY, Inc., 272 Dun Bldg., Buffalo 2, N. Y.

POSITIONS WANTED

ARCHITECTURAL DRAFTSMAN, Structural Designer; desires with industrial-constr'n Co. PW-3110, Engineering News-Record.

SUPERINTENDENT-PROJECT Manager, graduate Civil Engineer 48, contract negotiations, accurate estimator, successful record of customer and labor relations. Top field organization and supervision, layouts, 25 years industrial, dams, hydros, power houses, bridge, highway, docks, foundations, cofferdams, pile-driving, hotels, chainstore and housing. Foreign Service 16 years, Africa, South America, etc. Speaks many languages. Location not important. PW-3145, Engineering News-Record.

CIVIL ENGINEER, age 25, 5 years experience, interested in administrative position in engineering field. PW-3126, Engineering News-Record.

CIVIL ENGINEER—Age 30—B.S. 3 yrs. experience structures & h'ways—field & office, has N. Y. State Insurance Broker's license; wants position that will combine engineering with insurance. PW-3131, Engineering News-Record.

CIVIL ENGINEER—Building Official 33, married, wide experience construction, municipal work, good organizer, desires midwest. PW-3036, Engineering News-Record.

CONSTR.-ENGINEER, 22 yrs. exp. Supervision, layout, estimating, Sub-Contract negotiations. Executive ability. Age 45. New York City or vicinity. PW-3146, Engineering News-Record.

CONSTRUCTION MAN—age 36, 15 years diversified experience in field and office in building construction and sewer and water systems. Competent estimator and superintendent. Resume and photo furnished upon request. PW-3090, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT: 30 years on all types of buildings, sewage plants, bridges. Carpenter by trade—know forms and costs. Good organizer, available now. PW-3069, Engineering News-Record.

CONST'N SUP'T or Asst. C.E. 30. 4 yrs. exper. Ind., Pvt., public buildings. Travel. Excellent references. PW-3136, Engineering News-Record.

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Export Management

Large Import and Export Organization with own offices in Brazil and Argentina and excellent connections all over the world, large plant in USA engaged in edible oil refining, producers of fatty acids and allied commodities, seeks connection with

MANUFACTURERS OF ROAD BUILDING MATERIAL

RA-3041, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

WANTED

Estimators

All around power plant experience including take-off, pricing and current construction costs.

Please forward qualifications, experience and date available to:

GIBBS & HILL
INC.
Pennsylvania Station, New York 1, N. Y.

WANTED FOR CHEMICAL PLANT LOCATED IN SOUTH
ESTIMATORS

Must be experienced engineers, under 45, familiar with Refinery and Chemical Plant design and capable of estimating process equipment installations from flow diagrams and specifications. Give full information, experience record and salary expected in first letter. All replies confidential.

P-2907, Engineering News-Record
520 No. Michigan Ave., Chicago 11, Ill.

ENGINEERS
DESIGNERS & DRAFTSMEN

Electrical, Mechanical
Structural & Hydraulic

Reinforced Concrete
Designers & Detailers

FOR WORK ON

Industrial Plants
Paper & Textile Mills
Water Supply & Waste Disposal
Steam & Hydroelectric Power Plants
Electrical Transmission & Distribution

CHAS. T. MAIN, Inc.
80 Federal Street — Boston 10, Mass.

ENGINEERS

WANTED

The Tennessee Valley Authority wants Civil, Structural, Mechanical, Electrical, and Office Engineers and Estimators. The work is design and construction of large steam-electric and hydroelectric projects and transmission systems. Salaries start at $3600, $4350, and $5150 for 40-hour week. Some work is scheduled more than 40 hours and pays overtime. All jobs carry automatic within-grade increases for satisfactory service, liberal vacation leave, sick leave, and retirement benefits. Design and estimating jobs are in Knoxville and Chattanooga, Tennessee. Field and office engineering jobs are at construction sites in the Tennessee Valley area and at Paducah, Kentucky.

Write the
TENNESSEE VALLEY AUTHORITY
Division of Personnel
Knoxville, Tennessee

DRAFTSMEN

For detailing Reinforcing Steel, Steel Windows, Steel Joists and similar products. Only those experienced this or allied fields will be considered. Permanent position to qualified applicants. Air conditioned office, 40-hour week, overtime, hospitalization and group insurance plans, paid vacations. Location Richmond, Virginia.

Reply giving brief resume of experience, education and salary expected.

P-3106, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

ENGINEERS

Major Petroleum Refinery Construction Company located in New York City desires to add to its expanding staff. If you can quality for one of the jobs listed below and are interested in a challenging opportunity please submit your resume in detail and past earnings record to the box number below. Our employees know of this ad.

SCHEDULING ENGINEER experienced in job scheduling preferably on petroleum or chemical plants starting with the engineering and proceeding through procurement and construction.

CONSTRUCTION SUPERINTENDENT must have experience in construction of oil refineries and the exercise of executive authority at job site. Must be able to travel.

ASSISTANT TO CONSTRUCTION AND PROCUREMENT SUPERVISOR requires supervisory field erection experience on oil refineries and chemical plants as well as some experience in procurement, expediting and inspection of refinery equipment. Headquarters in New York City with some travel required.

FIELD ENGINEER experienced in interpretation of drawings, layout and inspection of oil refining or chemical plants. Also must work closely with Field Superintendent supervising sub-contractors and scheduling of erection operations. Must be graduate civil or mechanical engineer.

P-2957, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

WANTED

Civil Engineers and Topographic Draftsmen

for investigation and planning of flood and low flow control and related projects. Experience in hydraulics and hydrology desirable for engineers, but not necessary. Permanent positions, opportunity for advancement. Address inquiries to

State of Illinois, Division of Waterway
201 West Monroe Street, Springfield, Illinois

HIGHWAY ACCOUNTANT
WANTED

Accountant experienced in highway accounting and knowledge of Spanish language wanted for Ecuador, South America. Minimum 2 year contract. Salary $6,600. Free of local taxes. Send experience records, references, etc.

Suite 52, 1737 "H" Street, N. W.
Washington, D. C.

ELECTRICAL ENGINEER

Large Industrial Corporation with Foreign Operation
Excellent Opportunity
Recent Graduate Acceptable
Prefer Some Experience in Power Field
Reply Stating Age, Education, Experience and Salary Expected.

P-3161, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

WANTED

Sanitary Engineer

Age 30 to 40 years. Experienced in treatment of industrial plant wastes. Accustomed to client and public relations.

Please forward qualifications, experience, and date available to:

GIBBS & HILL
Inc.
PENNSYLVANIA STATION
NEW YORK 1, N. Y.

Permanent Positions Open to
ENGINEERS

. . . after training at full-time pay . . . as

Consultants in
Fire Protection Engineering

to top U. S. and Canadian industry. Usual pension and other benefits. Excellent opportunities; fast-growing engineering organization.

Write complete qualifications to:

P-2807, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

POSITIONS WANTED

(Continued from page 80)

ESTIMATOR-MANAGER Construction. All types buildings, concrete and masonry structures. Top flight and practical field man. Engineering, reduction and thirty years experience. Now employed Middle Eastern States but wants connection with medium size contractor who needs and will pay for know-how. PW-3014, Engineering News-Record.

GENERAL SUPERINTENDENT 48—25 years experience—heavy construction, highways, airports, bridges, powerhouse, cofferdams, tunnels, sewage systems, heavy industrials, have following of experienced men. Now employed but available for long term employment. PW-3023, Engineering News-Record.

MECHANICAL ENGINEER. Broad experience in the mechanical design of airfield fueling systems, oil bulk storage plants, vehicular tunnels, docks, industrial buildings, etc., and other mechanical piping problems associated with consulting Civil Engineering firms. PW-3134, Engineering News-Record.

PLANT LAYOUT Engineer-Designer, 48, experienced board & field work, Industrial plant engineering projects; Piping, Processing equipment, mechanical Installations & Structures. Salary $8000.00. Can relocate. PW-3094, Engineering News-Record.

PROJECTS MANAGER, Construction Supt., Engineer 47, sober, reliable, 25 years experience supervising commercial, Industrial, Mechanical and public buildings. Southeast preferred. PW-3068, Engineering News-Record, New York 36, N. Y.

SUCCESSFUL TOP Monumental building and heavy construction man presently in charge of all work for internationally known long established construction company desires immediate change. PW-2585, Engineering News-Record.

STRUCTURAL DRAFTSMAN, age 31, experience 12 years. Desires position in Southern or Western State. Available after Feb. 1, 1952. No objection to general duties with small firm. PW-3082, Engineering News-Record.

SUPERINTENDENT 25 years construction experience, bridges, dams, disposal plants, pumping stations, concrete structures, sewer and water systems, heavy excavation rock and soil, waterfront work, etc. Good organizer, know men and equipment, familiar with labor and material costs and distribution. Available immediately, any location. PW-2991, Engineering News-Record.

TRACK AND Special track-work Specialist. Railroad, subway, elevated, street railway and special track-work experience. Tee rail and Girder rail work. Broad engineering and construction experience, especially in the transportation field. Thirty-five years experience in private industry and government activities in design, construction and economic fields. Availability is dependent upon the location and incentives offered; whether on a full-time or part-time basis. PW-3034, Engineering News-Record.

SELLING OPPORTUNITY WANTED

SALES REPRESENTATIVE Available for St. Louis district. Construction, Building, Industrial Equipment, Tools. Experienced salesman and organizer. RA-2952, Engineering News-Record.

WORK WANTED

STRUCTURAL DETAILING Wanted by established responsible firm. WW-3024, Engineering News-Record.

WANTED
ACTIVE INTEREST IN CONSTRUCTION BUSINESS
Experienced In All Fields

BO-3147, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

FOR SALE
SURPLUS TRACKWORK EQUIPMENT
RAIL CRANES—TRACK WRENCHES—SAWS & DRILLS—TIE TAMPERS—3-TON LOCOMOTIVES —BALLAST REGULATING & DRESSING UNITS MISCELLANEOUS EQUIPMENT
Write for full details
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FOR SALE
1—10B Bucyrus Erie Backhoe, with Shovel Front Attachment, and Special Trailer.
WANTED
1—¾ C. Y. Material Rehandling Bucket.
1—Truck Tractor and Trailer 25 to 30 ton.
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- 1 Erie 1 Cu.Yd. Clamshell Bucket with teeth and counterweight
- 1 Haiss 1 Cu.Yd. Clamshell Bucket with teeth and counterweight
- 1 - 1½ Cu.Yd. Owen Type D, Heavy Duty Clamshell bucket
- 1 McKiernan-Terry Pile Extractor E4
- 2 #7 McKiernan Terry Pile Hammers
- 1 #1 Vulcan Pile Hammer

UNDERPINNING & FOUNDATION CO., INC.
155 East 44th Street New York, N. Y.

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IMPORTED STEEL
HR—MILD—PRIME
ANGLES

1/2 x 1/2 x 1/8	— 20'
3/4 x 3/4 x 1/8	— 20'
1 x 1 x 1/8	— 20'
2 x 2 x 3/16	— 20'
2-3/16 x 2-3/16 x 1/4	— 20'
2-3/8 x 2-3/8 x 1/4	— 20'
3-1/2 x 3-1/2 x 3/8	— 20'
4 x 4 x 3/8	— 35'
6 x 4 x 7/16	— 40'

ROUNDS
3/8 x 30' 9/16 x 30' 15/16 x 30'
FOB Miami—Car—Truck
Pan Atlantic Steamship
FLORIDA STEEL SUPPLY CORP.
PO Box 486 Tel. 88-5222
Hialeah, Florida

WANTED

WANTED
STEAM ROAD ROLLER STEAM FIRE ENGINE

Also interested in other items of steam industrial, railway, etc. machinery. The older the better. Not necessary be in operating condition as wanted for museum purposes.

R. H. Whisler,
Room 615
511 Locust St. St. Louis, Mo.
Phone Chestnut 4474

WANTED

- 1 Ingersoll-Rand class "ES" air compressor with or without electric motor 300 CFM or larger.
- 1 Large air receiver.
- 1 Drill bit sharpener.

W-2979, Engineering News-Record
330 W. 42nd St., New York 36, N. Y.

WANTED—DRYER
Approx. 5 ft. dia. x 20-25 ft. long, complete with 4 trunnion rollers with bearings, two roller rails, drive gear & pinion thrust bearing.
A. M. BRADLEY
235 Rialto Bldg. Kansas City, Mo.
Ha. 1269

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L.B.SMITH INC.

OFFERS

AIR COMPRESSORS

Schramm 105 cubic foot gas powered compressor on 4 steel wheels.
Ingersoll-Rand 105 cubic foot, Waukesha gasoline power, on two rubber tires.
Gardner-Denver 160 cubic foot gas powered compressor on 4 steel wheels.
Worthington 210 cubic foot, two-stage, air-cooled, on steel wheels with Hercules diesel.
Gardner-Denver 365 cu. ft. Diesel Rebuilt.
Gardner-Denver 500 cu. ft. diesel, new condition.
Pennsylvania 12" x 10" class 3A single cylinder, 353 cubic foot P.D., flat belt driven 50 HP slip ring motor.
Worthington two-stage, water-cooled, vertical 350#, 80 CFM, new condition.
Paving breakers, jackhammers, wagon drills, tie tampers.

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Symons 3' short head.
Cedarapids Rock-It with 2025 jaw, 3033 mill, new.
Cedarapids 1236 Model 8C plant, new.
3033 Cedarapids Hammermill, Rebuilt.
10x7 Allis-Chalmers Blake type jaw crusher.
#1 Cedarapids Kubit impact breaker.
4' x 8' Kennedy Van Saun single deck.
4' x 8' Kennedy Van Saun double deck.
3' x 6' Kennedy Van Saun triple deck.
3' x 10' Symons double deck.
42" x 24' revolving screen.
16" x 90' bucket elevator.
80-ton, 2-compartment, 8'x18' storage bin with clamshell gates.
Conveyors—18"—24"—30"—36". Also belt.

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1½-ton Ford with any body.
2½-ton GMC, rebuilt.
1948 White Model WC20 dump trucks, new condition.
2000-gallon tanks on semi-trailer mounting.
New and rebuilt dump bodies.
2,000 gallon tanks on semi-trailer mounting.

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1½ KW to 125 KW, alternating and direct current, gasoline and diesel powered.

GASOLINE AND DIESEL ENGINES

Buda, Hercules, Hill diesels, rebuilt.
New and rebuilt Murphy diesels, ME-4 & 46.
GM 6 and 12 cylinder diesels, practically new.

SHOVELS—CRANES

Lorain L-50, 1-yd. diesel. New condition.
L-41 diesel powered ¾-yd shovel, rebuilt.
Brownhoist 1-yd. gas shovel and crane.

SHOVEL & CRANE ATTACHMENTS

Lorain TL-20 shovel attachment.
Lorain 41 Chain Crowd Shovel Attachment. Complete.
Lorain 40 Hi-Lift shovel attachment.
P&H 203 shovel attachment.
Chain crowd Lorain 30A shovel attachment.
Bucyrus-Erie 1½-yd. rock bucket.
Lorain 80-820 fairleads.

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Lorain TL-25 hoe attachment, new.
Lorain 30 hoe attachment complete.
¾-yd Lorain, 40, LBS #8105. 44" cutting width.
28" outside width solid bottom type LBS #4377, good condition.
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NEW TAGLINES

McCaffrey Model 648 for 1¼ to 2-yd crane.
McCaffrey Model 638 for ¾-yd to 1-yd crane.

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Lorain 41, ¾-yd. LBS #8800, rebuilt.
New Lima 1-yd, Amsco, LBS #2295.
Bucyrus-Erie 1¼-yd gas air, LBS #3782, fair.
Lorain 75B, 1½-yd. manganese bucket, LBS #8538.
Lorain 75B, 1¼-yd extended lip, 1¾-yd LBS #2260.
Pettibone-Mulliken 2-yd Lorain 82 or 820, manganese, LBS #5361.
Pettibone-Mulliken 2-yd for 3500 Manitowac LBS #5763.
Esco 2½ yd cast weld dipper with bail & teeth

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Concrete Finishers

Jaeger type "L" double screed, 10½'-12½', rebuilt.
Heltzel 10'-12' finisher, rebuilt.
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2 Koehring 10'-12', rebuilt.

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1230'—Heltzel 9"x8" forms with stakes.
1430'—Heltzel 10"x8" forms, with stakes.

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Cleveland formgrader, new 1944, rebuilt.
Carr formgrader, new 1944, rebuilt.

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Keystone 70 well drill. Good.
Sanderson-Cyclone #42 well drill, new.
Sanderson-Cyclone #44 well drill, new.
Bits—Stems—Bailers—Sockets—Etc.

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New Layne Bowler type 18 deep well pump with right angle gear drive. 3000 GPM at 120' TDH.
Used and rebuilt pumps, all sizes, gasoline, electric or diesel.

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Austin Western 77 tandem drive, scarifier, 12' blade, gas power, hydraulic controls.
Allis Chalmers Model D, tandem drive, scarifier, enclosed cab.

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IMMEDIATE SHIPMENT

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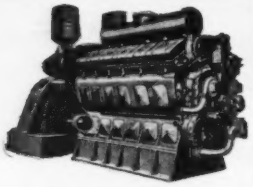

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KVA	Make	Model	HP	RPM	KVA	Make	Model	HP	RPM
1875	Fairbanks Morse	33F16	2000	300	375	Enterprise	DSG-6	450	450
1420	Fairbanks Morse	38D8¼	1600	720	330	Superior	KNA	396	514
1250	General Motors	16-278A	1600	720	312	General Motors	6-268A	450	1200
937.5	General Motors	12-567	1080	720	312	Clark	MD-4	375	327
625	Alco	6-12 ½x13T	750	600	125	General Motors	3-268A	150	1200
425	Baldwin	VO-6	510	450	75	General Motors	4043C	90	1200
400	Buckeye	80	480	600	62.5	Int'l Harvester	UD-18	76	1200

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DIESEL DIVISION, 50 CHURCH ST., NEW YORK 7, N. Y.

Portable Crushing Plant: Pioneer 40-V, diesel powered, new 1949.
Crushers, Jaw: Sizes 12" x 15" to 48" x 60".
Crushers, Reduction Type: Symons 2 ft., Cone, coarse bowl. Telsmith 13-B, Gyratory, 13" opening, all steel, 50 H.P. motor.
Dryers or Kilns: 2—10 ft. x 90 ft. heavy duty with or without auxiliary equip., condition like NEW.
Diesel Motor: Cat. D13000 port. on skids, 122 H.P.
Cranes: Lima 802 steel erector's Crane or dragline, 120 ft. boom, 20 ft. jib, with powered boom, condition like new. Northwest model 95, diesel, 80 ft. boom, 2¼ yd. capacity, used nine months.
Shovel, Diesel: Lima 1201, Cummins motor, 3 yd. capacity, new 1951.
Compressors: Worthington DC2, 29- 18½ x 21, motor 600 H.P. synchronous, 440 volt, with all auxiliary equipment. 4—Ing. Rand Diesel port., 500 cu. ft. @ 100 lbs. pressure, new 1951.
Electric Motors: 2—NEW 1000 H.P., 1800 RPM, 2300 volt, drip proof with automatic switch gear, UNUSED. 1—950 H.P. Hoist Motor, 3 phase, 60 cycle, 443 RPM, 2200 volt, with all control equipment.
Mine Hoists: 150 H.P., 6'6" dia., 6'8" face, 200 H.P., 72" dia., 48" face, 250 H.P., 60" dia., 72" face, 200 H.P., double drums, 8 ft. dia., 4 ft. face, one clutched. All 3 phase, 60 cycle, 2200 volt, with control equipment. Head Frame for double shaft, 16'9" x 17'2", height 55 ft. with or without 8 ft. dia. sheaves for 1-⅛" rope. Other Hoists 100 H.P. to 1050 H.P., single and double drum with electric equipment.

A. J. O'NEILL
Lansdowne, Pa.
Phila. Phones: MAdison 3-8300—3-8301

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Sales—Rental
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15 CFM	LINDSAY (Gas) 2 Pneu
25 CFM	LINDSAY (Gas) 2 Pneu
30 CFM	WORTH. (Gas) 2 Pneu
30 CFM	LINDSAY (Gas) 2 Pneu
60 CFM	INGERSOLL (Gas) 2 Pneu
60 CFM	WORTH. (Gas) 2 Pneu
105 CFM	WORTH. (Gas) 2 Pneu
105 CFM	WORTH. (Gas) 4 Pneu
160 CFM	WORTH. (Gas) 2 Pneu
160 CFM	WORTH. (Gas) 4 Pneu
210 CFM	WORTH. (Gas) 4 Pneu
315 CFM	WORTH. (Gas) 4 Pneu
315 CFM	WORTH. (Diesel) 4 Pneu
500 CFM	WORTH. (Diesel) 4 Pneu
575 CFM	WORTH. (Diesel) 4 Pneu

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— LIKE NEW —
396 CFM—100 H.P. Motor—100 ≠ Schramm Model 420 Base Mounted — 3/60/220/440 — Built-in type with self contained cooling system—Three available —immediate shipment.

GUARANTEED PERFORMANCE

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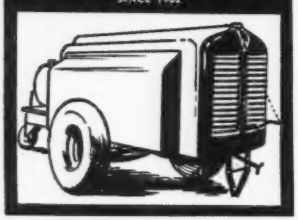
SINCE 1902



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Steam Pile Hammers and Extractors
Pile Driving Accessories
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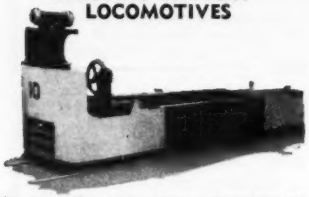

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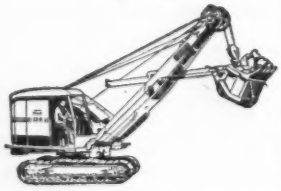

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General ½ Yd. Crawler Crane & Backhoe
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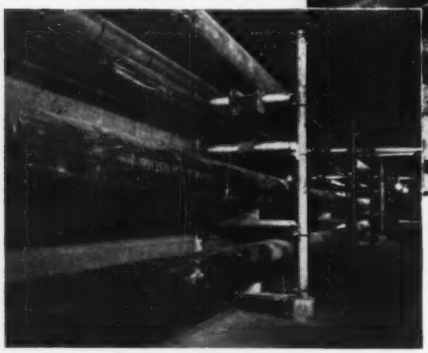
In the air conditioning chilled water distribution system



THIS UNIVERSITY COMBATTED THE CORROSION PROBLEM WITH

Byers Wrought Iron Pipe

When plans were made for the air conditioning chilled water distribution system at a well-known university in the Southwest, the specifiers followed sound, proven practice in safeguarding the installation against premature failure and excessive maintenance by specifying genuine wrought iron. Over 116 tons of Byers Wrought Iron pipe was used in the chilled water header piping of the central water chilling station, chilled and condenser water lines, and steam condensate lines.

A network of chilled water lines, housed in a tunnel, carry the water from the power plant to the buildings. A portion of the tunnel installation is shown above. The two lower lines in the picture carry chilled and condenser water; the smaller, uncovered line above them carries steam condensate. Zumwalt and Vinther, Dallas, were the engineers on the job. R. O. Davis, Inc., Austin, were the contractors.

Byers Wrought Iron pipe has a record of long, dependable service in every one of these "hot spots." Its wide-spread and continued use in these services is the best possible index of its ability to stay on the job longer, at lower cost per year.

You will find some helpful information on the use of wrought iron in our bulletin, WROUGHT IRON IN REFRIGERATION AND AIR-CONDITIONING SYSTEMS.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco. Export Division: New York, N.Y.

Why Genuine Wrought Iron Lasts

This notch-fracture test specimen illustrates the unique fibrous structure of genuine wrought iron—which is responsible for the high corrosion resistance of the material. Tiny threads of glass-like silicate slag, distributed through the body of high-purity iron, halt and disperse corrosive attack, and discourage pitting and penetration. They also anchor the initial protective scale, which shields the underlying metal.

BYERS

CORROSION COSTS YOU MORE THAN WROUGHT IRON

WROUGHT IRON

TUBULAR AND HOT ROLLED PRODUCTS

ELECTRIC FURNACE QUALITY ALLOY AND STAINLESS STEEL PRODUCTS

New track-gaging devices

Two new devices have been developed by engineers of the New York, Chicago & St. Louis R.R. for obtaining more accurate and more uniform gage when relaying railroad rails and are now on the market commercially.

The first device is a template that is used to position the tie-plates in approximately their correct position on the ties (upper photo). It is followed by the main gaging machine, of which the key element is the runner or shoe, about 8 ft long and having a width equal to that of the base of the rail to be laid. It is kept in correct alignment and at the required distance from the opposite rail by two flanged dollies riding on that rail. Tops of the plates are daubed with grease in advance of the runner so that it glides over them. As the runner is advanced, it moves each tie-plate into exact position to give the desired gage distance between rail heads. As it moves the plates into position, the anchor-spike holes are bored with an airdrill and the spikes driven with a pneumatic hammer while each plate is held in its proper position. Compressed air for operating both power tools is supplied by a compressor mounted on the gaging machine.

These new devices were developed by C. R. Wright, assistant chief engineer, W. M. S. Dunn, general roadmaster, and M. M. Stansbury, superintendent of maintenance-of-way equipment all of the N.Y.C. & St. L.R.R. The new devices are to carry the trade name "Dunright" and will be available from THE NORDBERG MFG. CO., MILWAUKEE, WIS.

(*Continued on next page*)

CONSTRUCTION ESTIMATES AND COSTS

1. Gives step-by-step instructions for estimating construction work of all kinds, including excavations, all parts of buildings, concrete, structural steel, materials transportation, profit, overhead, etc. A working guide for beginners — **a key to safer bids, better profits for all estimators.** By H. E. Pulver, Professor of Civil and Structural Engin., U. of Wisconsin. 2nd Edition. 653 pages, 287 illus., $7.50

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2. A helpful reference manual that can save you time, trouble, and money. It helps you ward off costly lawsuits by showing you—before you become involved—different types of legal troubles likely to occur in connection with construction work. It reviews and discusses 45 most common problems involved in the performance of a construction contract—indicates clearly how you can eliminate obstacles in your own construction relations. By L. Vernon Werbin, Member, New York Bar. 227 pages, $4.50

AIRPORTS: Design Construction and Management

3. A complete working handbook on all of the elements entering into airport development. Outlines the requirements of site and runway layout; provides tests and procedures necessary to complete the grading, drainage, and pavement design; discusses turfing and lighting; describes radio and traffic control and communications; deals in detail with airport buildings. By Horace K. Glidden, Dist. Airport Engin., Civil Aero. Admin., Idaho, Harvey F. Law, Gen. Supt. of Airports, Port of N. Y. Auth., and John E. Cowles, Chief, Airport Design Unit, 1st Region, Civil Aero. Admin. 662 pages, 150 illus., $8.50

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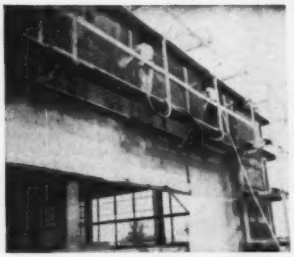

CEMENT GUN COMPANY APPLIES "GUNITE" ON WALLS OF NEW FACTORY

Photo, at left, shows our men applying 2" mesh reinforced "GUNITE" on outside walls during the construction of a new 1500' x 600' factory in Delaware. Photo, at right, shows a large area of completed work.

This project was done under plans and specifications of Albert Kahn Associated Architects and Engineers who have specified hundreds of thousands of square feet of this type of "GUNITE" wall work for Ford, Chrysler, General Motors, Pratt and Whitney, Glenn Martin and other large manufacturing concerns.

We may be able to help you on your construction or repair problems. For illustrations and descriptions of many different types of "GUNITE" jobs we have performed, write for free Bulletin A2400.

CEMENT GUN COMPANY
"GUNITE" CONTRACTORS
GENERAL OFFICES—ALLENTOWN, PENNA. U.S.A.
MANUFACTURERS OF THE CEMENT GUN

JACKSON ELECTRIC FLEXIBLE-SHAFT CONCRETE VIBRATOR

MODEL FS-150A

WITH EVERYTHING THE GENERAL CONTRACTOR COULD WANT

POWER GALORE: 2½ HP (continuous duty rating) Universal Motor provides more than ample power for uninterrupted placing of the stiffest mixes using the maximum length of shaft.

LIGHT SOCKET OPERATION: Wherever either 115 volt, 60 cycle single phase AC or Direct Current is available, this relatively inexpensive vibrator will do a bang-up job of concrete placement.

28 FOOT REACH: Available with any length of shaft up to 28 feet. Maximum length makes hard-to-get-to places readily accessible — saves time by making frequent changes of vibrator location.

CONVENIENT — RUGGED CONSTRUCTION: Double grip, skid-base handle with finger-tip control switch. Weighs only 50 lbs. Finest, smooth-running flexible shaft and fittings — built to take the most severe usage.

GRINDING: Countershaft attachment for quick conversion to wet or dry concrete rubbing.

HIGH FREQUENCY — 3 VIBRATOR HEADS: 8,000 to 10,000 VPM and availability of three vibrator heads assure rapid as well as thorough consolidation of the stiffest mix concrete under all conditions.

See this outstanding general-purpose electric vibrator at your Jackson Distributor or write for complete facts.

ELECTRIC TAMPER & EQUIPMENT CO.

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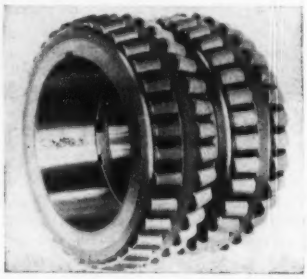
New Products . . .

Acid-resistant gloves

These canvas work gloves have been given a protective coating of Vinylite resins which resist acids, solvents and abrasion. Workmen handling acids or active chemicals are protected by the extreme chemical inertness of the coating. The combined chemical and abrasion resistance of the coating makes these gloves especially suitable for use in chemical processing plants and in most industries employing raw materials where economical long-wearing qualities are desired. They are available in both gauntlet and knit-wrist style from TILLOTSON RUBBER COMPANY, INC., NEEDHAM HEIGHTS, MASS.



New size anti-friction bearings

There is a new size range in the standard line of full-roll type tapered anti-friction bearings put out by the Tyson Corp. Single-row bearings are available in sizes from 2 to 20 in. O.D., two-row bearings from 4 to 20 in., and four-row bearings from 6 to 20 in. O.D. These new full-roll units have been engineered for use in gear drives, cranes and other heavy metal-working

(Continued on page 95)

this SIMPLICITY pays off for you

LONGER PUMP LIFE

MORE ECONOMICAL OPERATION

HIGHER SUSTAINED EFFICIENCY

The story behind the great performance of the Rex® Self-priming Centrifugal Pumps is *simplicity* itself. The fact is, Rex is the simplest self-priming centrifugal pump ever built. There are only 6 *basic* parts —the cover plate (1) — the adjustable air peeler (2) — the impeller (3) — the wearing plate (4) — the pump body (5) — and the leakproof seal (6).

For you, this extreme design simplicity has great advantages:

You get LONGER PUMP LIFE . . . fewer parts mean less wear.

You get ECONOMICAL OPERATION . . . fewer parts to maintain . . . all parts except stationary part of seal can be inspected, maintained or replaced without touching the engine. All this means less chance for trouble . . . far lower maintenance cost . . . more gallons of water pumped per gallon of fuel and per dollar of cost.

You get SUSTAINED EFFICIENCY . . . this pump is designed for quick, easy replacement of all wearing parts to restore new pump efficiency.

For all the facts see your Rex distributor or write for Bulletin 51-27. Chain Belt Company, 4633 W. Greenfield Ave., Milwaukee 1, Wis.

DON'T FORGET THESE OTHER IMPORTANT REX ADVANTAGES

High PORTABILITY

All parts EASILY ACCESSIBLE

REPLACEABLE WEARING PLATE

PATENTED ADJUSTABLE AIR PEELER *which means new pump priming efficiency for the lifetime of the pump.*

Combine them all with the basic Rex *design simplicity* with all parts readily accessible, and you have a pump that assures you years of low-cost, trouble-free service.

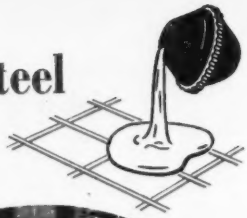
CHAIN BELT REX COMPANY ®

CONSTRUCTION MACHINERY . . .

The ACI Code proves it . . .

You don't have to buy so much steel

when you use American Welded Wire Fabric



● Read the American Concrete Institute Code and it will show you how to save steel by specifying American Welded Wire Fabric.

Example:

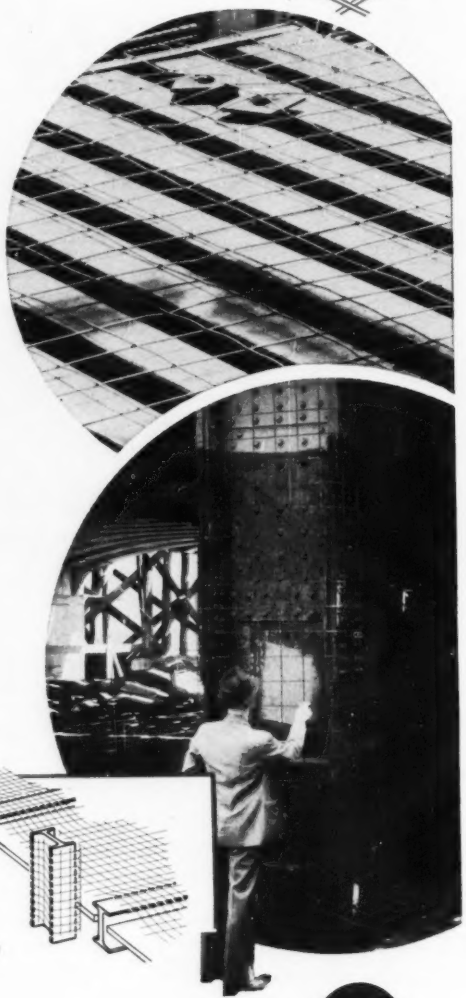
American Welded Wire Fabric is allowed a working stress of 28,000 psi for short span floor construction. That's 40% saving of steel over other types of reinforcing materials. Because the fabric is prefabricated, less labor is required—there is less steel to handle—it takes less time to place—there is less material to transport.

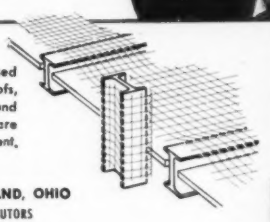
Example:

The specifications for reinforced concrete walls call for minimum ratios of steel area to wall area. If you use American Welded Wire Fabric, you can use 28% less steel area than with other reinforcing materials. You don't have to buy so much steel to get the strength you need.

These figures are impressive. They mean that you save critical steel when you use American Welded Wire Fabric. But just as important is the fact that you save critical labor. American Welded Wire Fabric is so easy to install that you just can't make a real comparison. Take slab construction: You simply unroll the fabric, lap the joints and you're done. No other reinforcement material can be installed so quickly.

Standard sizes of American Welded Wire Fabric are now readily available from jobbers' and dealers' stocks, supplemented by prompt mill shipments to identified projects. Present CMP Regulations assure adequate warehouse stocks of Fabric.





This sketch shows where American Welded Wire Fabric is used in modern concrete buildings. It reinforces walls, floors and roofs, can be draped over beams and girders and wrapped around pillars. Many uses of concrete in irregular structural shapes are made practical by American Welded Wire Fabric reinforcement.

AMERICAN STEEL & WIRE DIVISION, GENERAL OFFICES, CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
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UNITED STATES STEEL EXPORT COMPANY, NEW YORK

Every type of concrete construction needs

U·S·S AMERICAN WELDED WIRE FABRIC
reinforcement

UNITED STATES STEEL

and construction machinery.

The four-row bearing shown in the photo above, for example, measures 10¾ in. I.D., 15¾ in. O.D., and is 10 in. wide. At 500 rpm., it has a 126,000-lb radial capacity and 24,250-lb thrust.

The distribution of the load over a full complement of tapered rolls assures smooth operation at full radial and thrust capacities. Because of the close spacing of the rolls, possible deflection in cone and cup members is reduced to a minimum. Positive alignment is achieved by contact of the tapered rolls with the high back rib which is an integral part of the cone. TYSON BEARING CORPORATION, 1325 OBERLIN ROAD, MASSILLON, OHIO.

Mechanic's protractor

A handy mechanic's protractor designed for on-the-job measuring of angles is made of durable Vinylite plastic rigid sheet. Engineers, carpenters and construction men use this protractor as well as inspectors, sheet metal workers, pipe layout men, etc. It gives three readings at one setting: outside angle, adjacent inside angle, and inches-per-foot pitch.

Merely spread with the edges squarely against sides of an obtuse joint, as shown in the photo. The angle of bend or deflection is read at the top, while the obtuse angle is read simultaneously on the bottom row. The pitch is indicated by a second arrow on the inmost scale which reads up to 24 in. per foot. A straight edge may be used to extend one side of the angle whenever needed. Easily cleaned, it is resistant to water, oil, grease and most chemicals. INTERSTATE SALES COMPANY, 123 EAST 18TH STREET, NEW YORK 3, N. Y.

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FOUR conveyor flights . . . fully loaded . . . started from a *dead* stop with *squirrel-cage* motors.

That's the report from the Pecos, Texas, gravel plant of F. M. Reeves and Sons, where *squirrel-cage* motors are equipped with TWIN DISC HYDRAULIC COUPLINGS.

The "slip" of the hydraulic fluid at low rpm permits each motor to accelerate—*independently*—to working torque, and then to pick up the load smoothly. The couplings not only protect the motors against overload, they balance the load between motors.

And, at all times, they keep heavy demand current surges and loads off the line . . . make most electric motors perform more work.

At Reeves, Flight No. 1 is driven by a 30 hp, 880 rpm, squirrel-cage motor through a 17.5" Twin Disc Coupling . . . No. 2 and No. 3 flights each are powered with 25 hp, 1170 rpm, squirrel-cage motors driving through 14.5" Twin Disc Hydraulic Couplings . . . and No. 4 with a 50 hp at 1170 rpm squirrel-cage motor, through a 21" Twin Disc Hydraulic Coupling. The entire system moves from 180 to 350 yards of gravel and topping per hour.

There is one proved way to enable *your enclosed* squirrel-cage motors to pick up the load without other special equipment, to make these motors last longer, and to keep current demand surges off the line. Do as Reeves and hundreds of others have done. Equip your electric motors with Twin Disc Hydraulic Couplings. Write for Bulletin No. 144-C for complete information—and the name of your nearest dealer.

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CLUTCHES AND HYDRAULIC DRIVES

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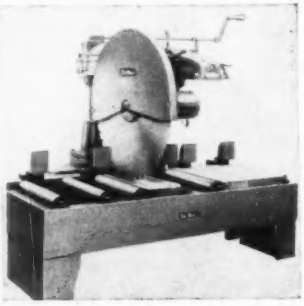
New products . . .

Fast cleanup with wet-dry vacuum cleaner

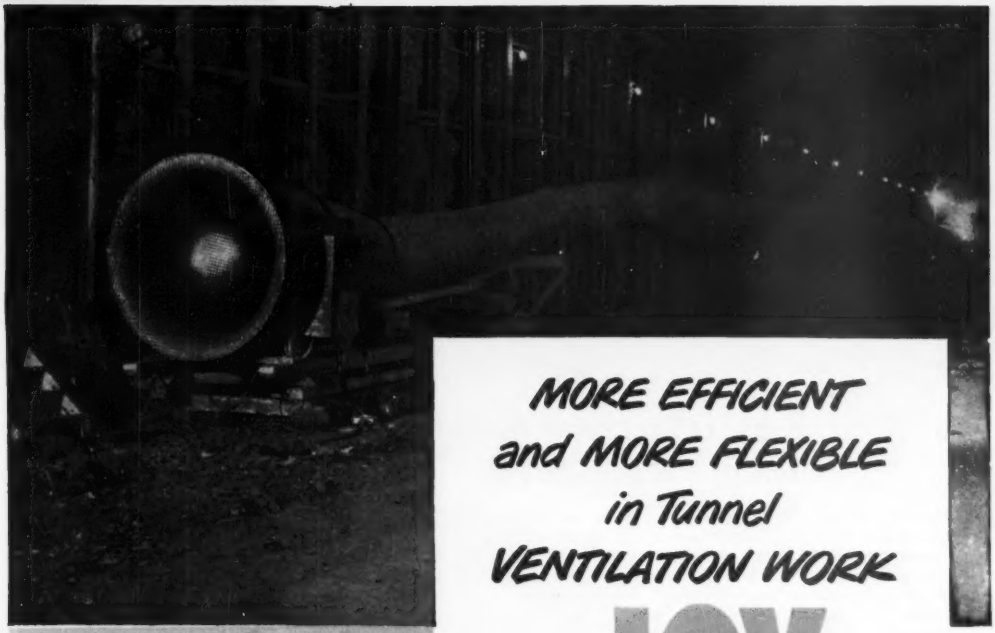
Institutional, industrial and commercial cleaning jobs are made a lot easier and simpler with this new Model WD-23 Clarke wet-dry vacuum cleaner. A three-stage turbine, powered by a 1-hp Universal type motor, both moisture-proof and rubber mounted, picks up water, dirt and dust. Water lift is 63 in. Its 15-gal tank is made of 18-gage steel. A newly developed positive action shut-off device warns operator when the tank is filled to capacity. The unit is furnished complete with hose, wand, water pick-up, squeegee tool and pick-up tool for carpets. CLARKE SANDING MACHINE COMPANY, MUSKEGON, MICH.



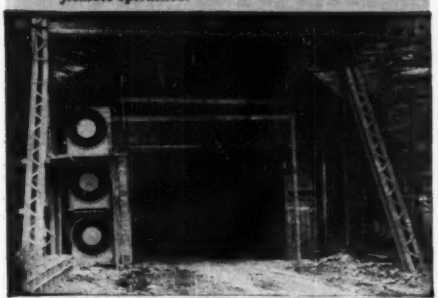
Timber cutter

A timber cutter that can cut 12x18 timbers in the cross-cut position and 12x12 timbers in the 45-deg miter position is now on the market. Powered by a 10-hp direct-drive motor, the cutter has features such as an unusually rugged arm and column, operating

(Continued on page 98)



In this tunnel job, a JOY AXIVANE Fan blows air to the face through lengths of flexible Spiratube.



Typical exhaust set-up—three JOY AXIVANE Fans mounted in the entrance of one of twin bores.

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JOY AXIVANE® FANS

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JOY AXIVANE Fans offer you the proved superior efficiency, low power consumption and quieter operation of vaneaxial design, *plus* the flexibility of easily adjustable blades to meet varying conditions—*plus* ready adaptability to installation in series for long-distance work. With JOY Fans, you can handle any tunnel job easiest and best, from start to break-through.

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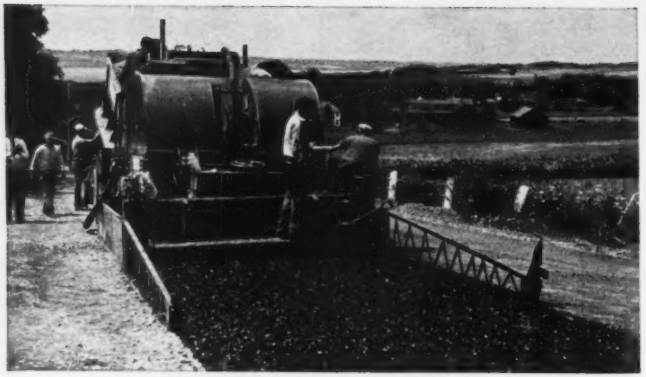

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with the Moto-Paver

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Moto-Paver uses beach sand, gravel, crushed stone or slag aggregates and various bituminous materials including tars, cutback asphalts, road oils and emulsions with equal efficiency. A uniform mix is assured.

Standard and heavy duty models for handling all types of resurfacing, retread and stabilization jobs under all kinds of operating conditions. See your local H & B distributor or write for Bulletin MP-49.

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levers located within easy reach, and a segmental back guide that permits rapid changeover from cross-cutting to mitering. A 36-in. dia saw blade operates at 1800 rpm and is the standard cutting blade used on this cutter.

As shown in the photo above, the roller conveyor table facilitates material handling. Material lies flat at all times and rolls along in one direction. DE WALT, INC., LANCASTER, PA.

Chemical cleans waste-clogged septic tanks

Sea-Cal is a balanced compound of chemically and biologically active elements which quickly restores waste-clogged septic tanks of any size to normal efficient operation. Working by enzyme action, it stimulates development of digestive bacteria which attack and liquidize all clogging proteins, fats and starches. Reported to strongly counteract adverse effects of excessive soaps, alkalis and cleaners, it is available from CHEMICAL RESEARCH PRODUCTS, 2040 15TH WEST, SEATTLE 99, WASH.

British diesel starting system

Here's a new and ingeniously simple compressed air-powered apparatus that offers many advantages over conventional mechanical methods of starting medium-sized diesel engines. The complete unit consists of an engine-driven compressor, an air storage tank, a distributor and a series of injector valves, one mounted on each of the cylinders. From the tank a feed pipe passes through a master on-off cock to a T junction, the cross piece of which continues as the main air trunk to the cylinder head injector valves while the right-angled branch (in smaller diameter piping) leads off to the distributor mounted either on the end of a cam or the crank-shaft. Small bore piping connects the distributor to the injectors.

Set in operation, air at 550 psi enters the feed pipe from the storage tank and passes along the main trunk to the injectors and down the branch line to the distributor. Air in the branch pipe is then routed by the distributor along one of the relay pipes to one of the injectors where it enters the valve and forces down a piston which, opening the valve head, allows air from the main trunk line to pass into the engine cylinder.

By the time the cylinder's power-stroke is complete, the distributor disk has rotated and the pressure in the

(Continued on page 100)

Faster Digging Teeth ...for Less Money

...to fit all dippers and buckets

Now stocked by dealers in every major city in the United States and Canada, *ESCO* adapters and box-type points will put speed in your digging and give you lower cost per yard.

ESCO adapters, which take the strain and shock of digging, are

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WOOD ROADMIXER PRODUCES

. . . "excellent roads at one-third the previous cost"

Board of County Commissioners, Pinellas County, Fla. From left to right on Wood Roadmixer: R. Hosey Wick, Vice Chairman; Edward H. LaVoie, Chairman; Sidney S. Parry. Standing next to mixer: James R. Shoecraft. Behind man with cap: John Chesnut. Photo by: Landwehr & Landwehr, Largo, Fla.

taxpayers get low-cost roads!

Edward H. LaVoie, Chairman, Board of County Commissioners, Pinellas County, Florida, writes as follows:

"We realized that in order to build good low-cost roads it was necessary for us to utilize our local materials, which are shell — sand — marl — material from our County-owned pit. Due to the high moisture content of this pit material, emulsified asphalt was chosen as the bituminous binder because of its adaptability. It could be mixed by the Wood mixer as it came from the pit, thus eliminating the expensive and time-consuming process of aeration.

"Up until the present time we have been forced to use the expensive high-type aggregate, but since purchasing the Wood Roadmixer we are now able to produce excellent roads at **one-third the previous cost.**"

For literature and prices on Wood Roadmixers and Wood Roadbuilding Equipment, see your Wood distributor or write us direct.

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New Products . . .

relay pipe is exhausted freely. The injector valve then closes, cutting off the flow of air from the main trunk, the actual closing load being carried by a return spring. Meanwhile the compressed air in the engine cylinder escapes through the normal exhaust boring. The distributor disk still rotating has already reached the point where the whole cycle begins with the next cylinder.

The injector valve body is an iron casting, but piston and valve head are of steel. The main valve can be lifted when necessary and rotated so that foreign matter can be cleared from the seat without the necessity of stripping down the valve. The system is already in use on many special engines and will be fitted as standard on newer commercial series. THE HYMATIC ENGINEERING CO. LTD., 6-10 WHITFIELD STREET, LONDON, W. 1, ENGLAND.

New Product Briefs

A heavy-duty, **vane type rotary pump** has been added to the existing line of rotary pumps manufactured by **Worthington Pump and Machinery Corporation, Harrison, New Jersey.** The pumps are manufactured in both internal and external bearing design; the external bearing models being especially suited for non-lubricating liquids such as gasoline and kerosene.

A **high-output baseboard** designed for residential use has a rating of 1100 B.T.U. at 215° F. A tilt-fin design is an exclusive feature of the new Brown Bayce Heet. Literature may be secured from the manufacturer, **Brown Products Co., Forest Hills, New York.**

An improvement in **metal corner bead,** permitting heavier thicknesses of plaster next to the bead itself, has been announced by **Inland Steel Steel Products Company, 4157 West Burnham Street, Milwaukee, Wisconsin.** The new feature, which has been added to the firm's familiar Milcor Super-Ex Corner Bead, provides for a greater depth of plaster between the bead and the wings. Also plaster grounds down to ½ inch can be specified with protection of corners against chipping and cracking.

Two **new air compressors,** 3 and 5 H. P. respectively, have been released by the **DeVilbiss Company of Toledo.** They now augment the company's line of 7½, 10 and 15 H. P. units introduced a short time ago. All of the sizes are available for either 125 or 175 pound pressure service.

In Denmark, 3 LeTourneau rigs

BUILD COPENHAGEN HIGHWAY

To reach this highway project, both Tournapulls and the Tournadozer were driven 10 mi. under their own power through the city of Copenhagen.

Performance of 2 Tournapulls and 1 Tournadozer earns extra 261,600-yard contract for Carl Jensen

Contractor Carl Jensen of Copenhagen, Denmark, a specialist in the most modern of dirtmoving methods, has achieved outstanding success in his operations during the past 2 years with a fleet of 2 electric-control C Tournapulls and one rubber-tired C Tournadozer.

On one typical job — eliminating hills and curves on the Copenhagen-to-Elsinore highway—his 3 modern, high-speed LeTourneau rigs graded and leveled approximately 91,500 cu. yds. of clay and sandy loam at minimum cost. Jensen's 14-yd., 18-ton Tournapulls cut down high areas as much as 15 ft. . . . raised the level of the road embankment in low areas as much as 20 ft. Tournadozer handled rough grading, leveling, and filling around culverts, as well as push-loading of the Tournapulls.

"Since finishing this job," says Owner Jensen, "I have obtained other contracts totalling about 261,600 cu. yds. which would have been impossible for me to take if I hadn't had these machines. I'm looking forward to expanding my LeTourneau fleet."

At home or abroad, Tournapulls and Tournadozers deliver more yards per hour at a lower-net-cost-per-yard. Alert contractors everywhere are standardizing on high-speed, rubber-tired LeTourneau rigs for more profit, more production under all conditions of climate and terrain. Ask your LeTourneau Distributor for actual production figures on work like yours.

Tournapull returns 27 yd. from fill to cut at high speeds. In 3000 hours of such high-speed operation, the unit was 85% mechanically efficient.

When not busy loading Tournapulls, 186 h.p. Tournadozer rough-grades highway right-of-way. Blade carries 2½ yds. of material per pass.

R. G. LeTOURNEAU, INC.
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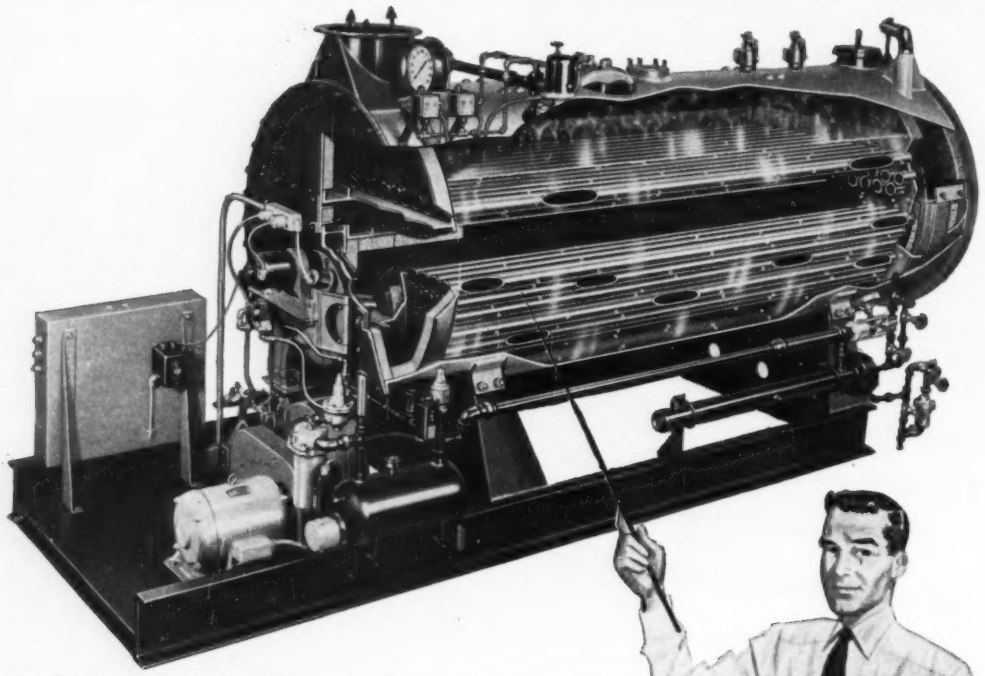
HIGH-SPEED, RUBBER-TIRED EXCAVATING • HAULING • LIFTING EQUIPMENT

CLEAVER-BROOKS STEAM BOILER

Four-Pass Construction

MEANS HIGH HEAT TRANSFER — GUARANTEED 80% EFFICIENCY



The basic reason for the high thermal efficiency and low fuel costs of Cleaver-Brooks Steam Boilers is graphically shown above.

Note the original and exclusive Cleaver-Brooks four pass construction of the boiler. The four complete passes of combustion gases traveling through the entire tube length of the boiler proper enables the boiler to absorb the greatest practicable amount of heat from the fuel burned.

All Cleaver-Brooks boilers are of the four pass design and the maximum useable heat is absorbed in these four passes before the combustion gases leave the boiler.

Cleaver-Brooks steam boilers offer many advantages . . . quick, effortless response to fluctuating steam demands — minimum manpower needed for operation and maintenance — clean — space saving — low cost installation — dependable performance — burns the fuel most available and most economical in your area — oil or gas.

Remember the name Cleaver-Brooks, it stands for the first and finest in steam boilers. Standard models available in sizes from 15 to 500 HP, 15 to 250 psi, oil, gas, combination oil and gas firing.

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350-A E. Keefe Ave., Milwaukee 12, Wis.
Builders of Equipment for the Generation and Utilization of Heat • Steam Boilers • Oil and Bitumen Tank-Car Heaters • Distillation Equipment • Oil and Gas-Fired Conversion Burners

Write for your copy of the latest illustrated Cleaver-Brooks Boiler Catalog. It tells and shows why Cleaver-Brooks Boilers will save you money.

Manufacturers Publications . . .

Shocks on Hydraulically Operated Machinery—A method of eliminating severe shock and vibration of hydraulically operated bucket loaders, power shovels and other tracked or rubber tired equipment is described in a new Bulletin (No. 700) just published. Since hydraulic fluid is practically incompressible, the vehicle itself must absorb impacts caused when a loaded bucket is moved or suddenly stopped, when the load is suddenly added or released, and when the loaded equipment moves over rough terrain. The booklet explains how the installation of a Greer Hydro-pneumatic Accumulator in the system absorbs these shocks fully. The accumulator consists of a steel shell containing a rubber bag precharged with gas. Hydraulic fluid forced into the shell through an oil port compresses the bag, thus any sudden impact against the hydraulic fluid in the system forces oil into the shell where it is cushioned by the gas in the bag. GREER HYDRAULICS, INC., 454 EIGHTEENTH ST., BROOKLYN 15, N. Y.

Fiber Insulation—Two booklets are available on Ultralite insulation—one for insulating ducts and the other for general building construction. The first is a 16-pager telling about its characteristics, thermal efficiency, methods of specification, density and other general information. The duct insulation is a wrap-around type thermal insulation applied to the exterior of ducts and their duct liner is primarily an acoustical insulation to be applied to the interior of the system. The second catalog is a 6-page folder telling where Ultralite is used in transportation, metal buildings, piping applications, coolers, original equipment and heating, ventilating and air conditioning. GUSTIN-BACON MANUFACTURING CO., KANSAS CITY 7, MISSOURI.

Standardization of Equipment—This 16-page booklet points out that the economy of having two or more light power units on the same job is the interchangeability of parts. The fact that some 97 manufacturers use "Cat" diesel engines in their products adds to the effectiveness of this interchangeability. The booklet is highly illustrated with pictures of bulldozers, scrapers, wagons and the like along with their attachments which are matched to the job and to the prime mover. Copies of the booklet (Form 30243) may be secured from CATERPILLAR TRACTOR COMPANY, PEORIA 8, ILLINOIS.

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COFFERDAMS have been set in Tampa Bay for the two main piers for the first bridge of the 14-mile causeway from St. Petersburg south to Manatee County, Fla.

Tampa Bay causeway starts to show

The 14-mile stretch of highway and bridge that three years hence is expected to shuttle the bulk of Florida's West Coast traffic directly across Tampa Bay from St. Petersburg to Manatee County is beginning to show on the lower reaches of the bay—but the vast $20,000,000 project is barely under way.

While nearly four miles of fill have now inched their way out into the bay like giant fingers, and coffer dams and piling show at the St. Petersburg terminus at Maximo Point, the overall construction amounts only to about 3% of the total, according to P. A. Hakman, resident engineer in charge for Parsons, Brinckerhoff, Hall and Macdonald, New York consulting engineers supervising the work for the State Improvement Commission.

As it moves out from St. Petersburg, the project will consist of a 4,200-ft fill to the first bridge, which will be 1,200 ft long with a 100-ft lift span over Maximo Channel; then a two-mile fill to the second bridge, a structure 1,500 ft long with a fixed 95-ft span over Bunces Pass; then a fill of a mile and a half to the main span, which will have an overall length of four and a half miles with the second spanning the main ship channel up Tampa Bay standing 155 ft above the water and reaching across the channel from 250-ft piers standing 840 ft apart.

• **Main bridge**—At the south side of the bay the main bridge will be met by a fill of a mile and three quarters which will lead to the next bridge, a fixed 350-ft span giving access to McGill Pass.

Main piers for the bridge and much of the other part of it will be poured on the site and huge concrete mixing equipment will be taken to the site by Hardaway Contracting Co., Columbus, Ga., who also holds the contracts for the construction of the two smaller bridges on the south side of the bay. Its bid totalled $7,614,236 and does not include the erection of the bridge's superstructure—the actual steel. That part of the work will be done by the Virginia Bridge Corp., awarded the contract on its bid of $3,873,991.

The north trestle leading to the main span will be a mile and a quarter long, ascending a five percent grade to reach the maximum height at the center span which will be of conventional cantilever design with a vertical clearance above the water of 145 feet, and a horizontal clearance over the ship channel will be 840 feet. The main bridge will be a mile and a quarter long. The south trestle will be two and a half miles long.

The Hardaway firm expects to get its equipment into the bay about March 1, Mr. Hakman said.

• **Roadway**—Contract for the roadway over the entire project, about 15 miles, has not been let and probably won't be for another year. It is estimated to cost about $500,000. The roadway will have two traffic lanes totalling 24 feet with 16-foot shoulders on each side. The bridges will also have two lanes, totalling 28 feet, with four-foot sidewalks on each side.

Although the bond issue floated by the Improvement Commission for the entire project totalled $21,250,000, contracts awarded to date total only $12,907,194, Mr. Hakman said, and cover the major portions of the work although that figure is subject to revision as changes in the original plans may be made.

Another fill, a mile and a third long, will lead to land on Terra Ceia Island. Two more fills, each about a quarter of a mile long, and another bridge, about 350 feet long, will take the highway across Terra Ceia Bay to its southern terminus on the mainland.

• **Work completed**—Going over general blue prints for the project at his offices here recently, Mr. Hakman said the contract for the filling on the St. Petersburg side of the bay was about 85 percent complete with the first two sections of fill all done but grading, and the third section 2,300 feet short of its center-of-the-bay destination. Contract for the northside fill is held by the Atlantic Dredging & Construction Co. of Satsuma, Fla., bid in at $338,200.

In dredging for the fill, the specifications called for the construction of a 12-ft boat channel parallel to the bridge and highway connecting Maximos Channel with Bunces Pass.

Piling for the first two bridges on the St. Petersburg side have already been precast and about half of those required for the approach to the first bridge, known in the plans as "Structure A" have been driven by the Hendry Corp., of Rattlesnake, Fla., who obtained the contract for the first two bridges on a bid of $838,940, according to Mr. Hakman.

The Hendry firm has already set coffer dams for the two main piers of the first bridge and have bulkheads in place on both sides of the span, making it about 30% complete. The second bridge, known as "Structure B" and the other part of the Hendry Corp. contract, is only about 10% complete. Contract for the fill on the south side of the bay is held by Benton & Co., Inc., of St. Petersburg which bid $241,827 and that firm is about 15 % of the way along on its share.

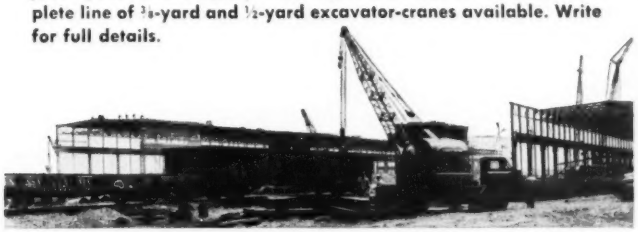
WORKS BOTH ENDS

ON BIG STEEL MILL PROJECT...

Get it done . . . and fast! That's the "word" at the site of U. S. Steel Company's new Fairless Works. And that's the reason James Armour Excavating Company is using two MICHIGAN Truck Cranes to handle and distribute materials at this huge steel mill project.

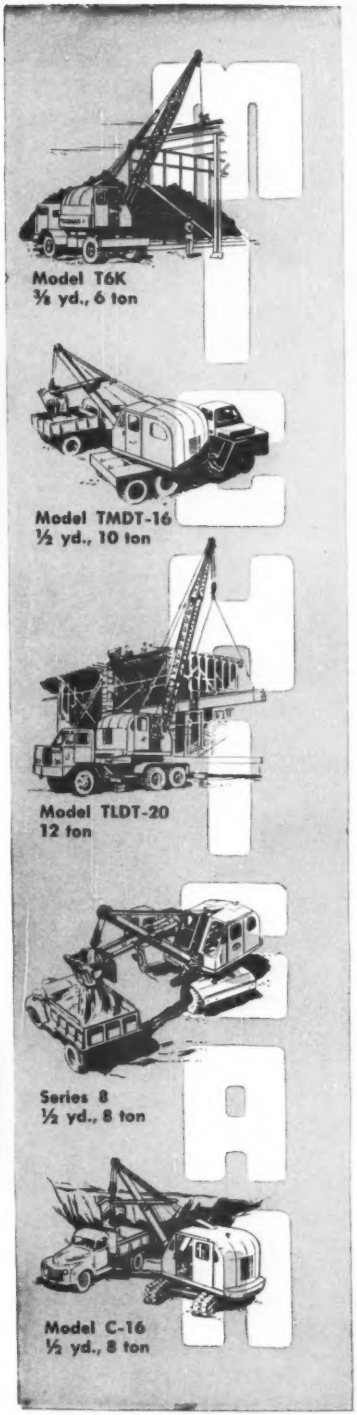
Here's just one example cited by operator Randall Auer: One of the MICHIGANS transferred pipe from a freight car to a truck, then followed the truck to a spot half-a-mile away where it unloaded the pipe. It then accompanied the empty truck back to the car for another load. The process was repeated until all the pipe had been removed from the car. Only MICHIGAN'S *speed and mobility* made it possible to work both ends of this job with one crane.

When *you* need an excavator-crane that has everything you want *plus* speed and mobility, investigate MICHIGAN . . . most complete line of ⅜-yard and ½-yard excavator-cranes available. Write for full details.



MICHIGAN POWER SHOVEL COMPANY

500 Second Street, Benton Harbor, Michigan, U.S.A.



Model T6K
⅜ yd., 6 ton

Model TMDT-16
½ yd., 10 ton

Model TLDT-20
12 ton

Series 8
½ yd., 8 ton

Model C-16
½ yd., 8 ton

More good aggregate comes out in the wash with high-speed scrubber on TIMKEN® bearings

TO meet the gravel and crushed stone industry's need for a machine which eliminates large amounts of clay and dirt from aggregate with minimum expense, Smith Engineering Works developed this high-speed Super Scrubber. Rapid rotation of the Super Scrubber's drum cascades the gravel with great impact, quickly and thoroughly disintegrating lumps of dirt, clay or objectionable coatings.

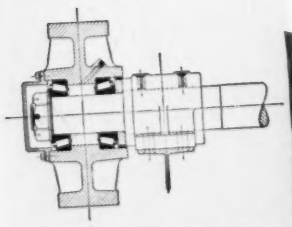
To withstand the heavy shock loads, Smith engineers mounted the trunion rollers and thrust rollers on Timken® tapered roller bearings. Timken bearings are also used in the Dodge-Timken pillow blocks supporting the pulley shaft.

Due to their tapered construction, Timken bearings carry both radial and thrust loads in any combination. They provide extra load-carrying capacity due to line contact between rollers and races. Incredibly smooth surface finish and true rolling motion reduce friction and wear.

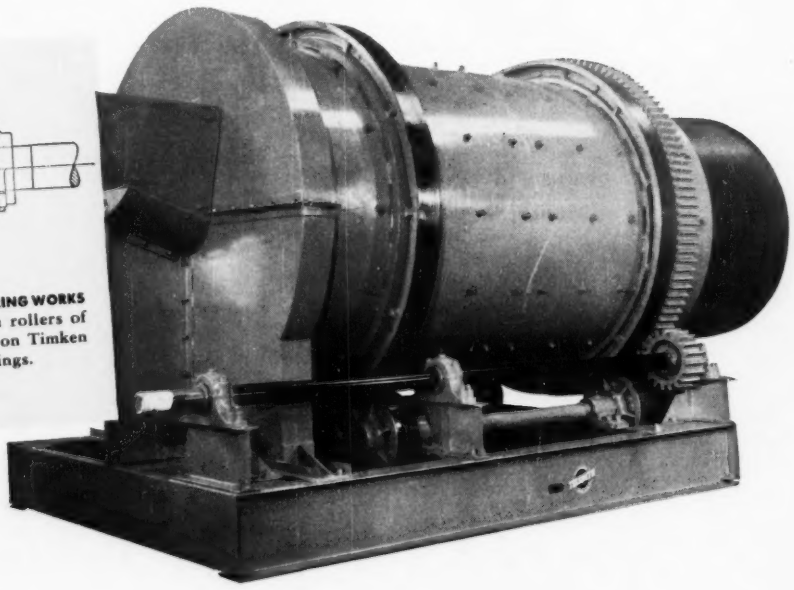
As a result, trunion rollers turn smoothly and effortlessly, high speeds are permitted and the scrubber is kept on the job with minimum time-out for maintenance and repairs. Because Timken bearings hold housings and shafts concentric, they make closures more effective. Dirt, dust and water are kept out; lubricant kept in.

If you're looking for dependable performance in the machines you build or the machines you buy, be sure to specify Timken tapered roller bearings. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



How **SMITH ENGINEERING WORKS** mounts the trunion rollers of its Super Scrubber on Timken tapered roller bearings.



DESIGN LEADERSHIP

The first Timken tapered roller bearing was produced in 1898. Since then the one-piece multiple perforated cage, wide area contact between roller ends and ribs, and every other important tapered roller bearing improvement have been introduced by The Timken Roller Bearing Company.

The Timken Company leads in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis steels.

TIMKEN

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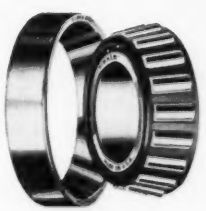
TAPERED ROLLER BEARINGS



NOT JUST A BALL — NOT JUST A ROLLER — THE TIMKEN TAPERED ROLLER — BEARING TAKES RADIAL AND THRUST — LOADS OR ANY COMBINATION